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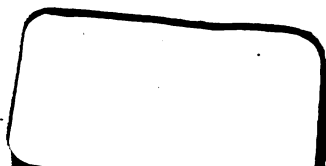
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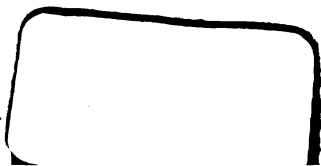
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TO THE
EXECUTIVE DOCUMENTS
OF THE
HOUSE OF REPRESENTATIVES
FOR THE
THIRD SESSION OF THE FORTY-SIXTH CONGRESS,
1880-'81.

IN 30 VOLUMES.



VOLUME 10.—Auditor of Railroad Accounts, Benevolent Institutions, &c.,
No. 1, part 5, volume 2.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1881.

INDEX TO HOUSE EXECUTIVE DOCUMENTS.

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REPORT

OF THE

SECRETARY OF THE INTERIOR;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE THIRD SESSION OF THE FORTY-SIXTH CONGRESS

IN THREE VOLUMES.

VOLUME II.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1880.

ERRATA.

In Report of Secretary of Interior, 1880, Vol. II.

Page 2, line 10, for "Vinita" read Southern State line of Kansas.

Page 6, line 8, for "53" read 33.

Page 24, line 15, for "pages 16 to 45" read pages 65 to 71.

Page 24, line 55, omit the words "at an average price of \$5.65 per ton, being."

Page 43, line 31, for "781" read 721.

Page 75, line 3, for "354.31" read 3,549.31.

Page 79, line 29, for "page —" read page 83.

Page 105, line 47, for "page 224" read 244.

Page 256, for "2,417,397.28" read 2,447,397.24.

Page 269, in column of "Amounts," for "48.00" read 46.00.

Page 307, in column of "Annual interest payment," for footing "5,597,658.20" read 6,597,658.22.

Page 308, in column of "Amount issued," for "\$187,605,680" footing read \$97,605,680.

Page 317, in column of "Total income Expenditures," for "4,245,593.75" read 7,025,593.75.

Page 317, in column of "Total expenditures," for "5,372,197.35" read 5,412,803.65.

Page 318, in column of "Estimated number of acres granted," for "2,727,403" read 2,729,403.

Page 319, in column of "Acres," for footing of "14,310,904.16" read 14,332,094.11; in column of "Amount," for "106,462.00" read 106,462.70; in column of "Estimated quantity of acres of granted land remaining unsold," for "174,784.70" read 174,878.47; for "1,700,000" read 300,000; and for total of "164,512,334.38" read 163,199,793.75; and in column of "Estimated value of unsold lands," for "8,500,000" read 1,500,000, and for total "322,899,130.85" read 322,492,788.85.

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REPORT

OF THE

AUDITOR OF RAILROAD ACCOUNTS.

DEPARTMENT OF THE INTERIOR,
OFFICE OF AUDITOR OF RAILROAD ACCOUNTS,
Washington, D. C., November 1, 1880.

SIR: In compliance with statutory requirements (20 U. S. Statutes, 169, Sec. 3), I have the honor to submit the following report, for the fiscal year ending June 30, 1880, on the condition of the property, business, accounts, and affairs of the several railroad companies to which, or to their predecessors, the United States have granted, and which have directly or indirectly received, any loan of credit or subsidy in bonds or lands, and the geographical location of whose railroads is "in whole or in part west, north, or south of the Missouri River."

CONDITION OF THE PROPERTY OF THE PACIFIC AND OTHER RAILROADS.

During the fiscal year two inspections of railroad property have been made, the results of one of which were embodied in my last annual report, while those of the other are given in this report, together with the results of an inspection made in August and September, 1880.

The very full and able report of Mr. Aurin B. Nichols, C. E., railroad engineer of this office, is made part of this report, and immediately precedes the appendixes and tables.

The railroads inspected and reported on are as follows, namely:

	Miles.
Union Pacific: Council Bluffs to Ogden	1,036
Union Pacific: Cheyenne to Kansas City	745
Union Pacific Branches:	
Summit County	9
Utah and Northern	339
Central Pacific: San José to Ogden	872
Central Pacific Branches: Visalia Division	147
Leased lines:	
Northern Railway and California Pacific (new route, San Francisco to Sacramento)	90
San Pablo and Tulare	47
Southern Pacific	550
Los Angeles and San Diego	28
Los Angeles and Independence	17
Southern Pacific of Arizona	276
Central Branch Union Pacific: Atchison to Waterville	100
Spoux City and Pacific: Sioux City to Missouri Valley	76
Northern Pacific:	
Duluth to Bismarck	448
Bismarck to Little Missouri	152
Kalama to Tacoma	105
Tacoma to Wilkeson	31
Ainsworth to Terminus	18

2 REPORT OF THE AUDITOR OF RAILROAD ACCOUNTS.

	Miles.
Northern Pacific leased lines:	
Western Minnesota	61
Saint Paul to Sauk Rapids	75
Oregon and California: Portland to Roseburg	195
Oregon and California leased lines:	
Oregon Central	45
Western Oregon	50
Saint Louis and San Francisco: Pacific to State line	293
Saint Louis and San Francisco leased lines: Atlantic and Pacific	34
Missouri, Kansas and Texas: Vinita to Junction City	183
Atchison, Topeka and Santa Fé: Atchison to State line	471
Saint Paul and Duluth: Saint Paul to Duluth	156
Total	6,655

It is gratifying to be able to say that, during the past year, the condition of all railroad property in the United States has been much improved, more especially that of the railroads west of the Mississippi River. It is still more gratifying to be able to say that, among those railroads lying west of the Mississippi, the most marked improvement has been on the great trunk line of the Union and Central Pacific Companies and of which the United States Government is a creditor to an amount of nearly \$80,000,000.

Stability of rates, even though rates have been reduced, has given larger earnings, which in turn have enabled liberal expenditures to be made for maintenance and improvement to the manifest advantage of the traveling public and shippers, as well as of the properties themselves.

In order to show the expense incurred in maintaining the several properties and to afford means of comparison, the following tabular statement has been prepared from the reports of the companies rendered to this office for the two fiscal years ending June 30 1880. The term "maintenance of way" includes the following items: Steel and iron rails; joint fastenings; spikes; frogs and switches; labor repairing track; tools; wages of roadmasters, foremen, clerks, mechanics, laborers, and watchmen; cross-ties; ballast; expenses of road trains—engineers, firemen, fuel, oil, water, &c.; removing snow and ice; repairs of bridges, road-bed, snow-sheds, snow-galleries, snow-fences, shops, engine-houses, turn-tables, station buildings, section houses, fuel and water stations, culverts, tunnels, road-cars, telegraph, and tools; and incidental expenses.

Name of road.	Amount expended for maintenance of way for two years, ending June 30, 1880.	Average miles operated.		Amount per mile per annum expended for maintenance of way.	Order resulting.
		1879.	1880.		
Union Pacific (as consolidated)	\$5,123,626 25	1,814.8	1,814.8	\$1,411 62	
Central Pacific	4,048,258 67	2,210.7	2,388.9	879 94	
Sioux City and Pacific	289,272 08	107.4	107.4	1,348 70	
Texas and Pacific	1,026,911 09	443.86	483.86	1,106 82	
Saint Louis and San Francisco	568,477 80	333.3	510.1	674 03	
Saint Louis, Iron Mountain and Southern	1,567,521 28	684.5	684.5	1,145 01	
Little Rock and Fort Smith	106,497 49	165	165	319 69	14
Missouri, Kansas and Texas	815,821 22	766	766	518 97	13
Atchison, Topeka and Santa Fé	1,784,335 60	852.3	1,190.3	873 56	2
Chicago, Rock Island and Pacific	3,567,180 10	1,175.1	1,273.6	1,456 76	1
Iowa Falls and Sioux City	108,515 12	183.7	183.7	295 09	15
Winona and Saint Peter	461,057 94	385.8	456	547 70	12
Saint Paul and Duluth	304,933 85	169	169	802 18	6
Chicago, Milwaukee and Saint Paul	2,771,943 81	1,709.3	2,404.9	673 75	10
* Northern Pacific	483,454 12		721	670 58	11
Average for two years	23,026,805 80	11,020.76	13,340.06	915 23	

* Northern Pacific for one year ending June 30, 1880.

From this table it will be seen that five of the fifteen companies named have expended from 20 to 50 per cent. more than the average amount, viz: the Chicago, Rock Island and Pacific, the Union Pacific, the Sioux City and Pacific, the Saint Louis, Iron Mountain and Southern, and the Texas and Pacific; while the remaining ten companies have expended from 5 to 60 per cent. less than the average—the Central Pacific and the Atchison, Topeka and Santa Fé expenditures being but about 7 per cent. below the average. The five roads first named expended \$11,574,510 on 8,590 miles one year, equal to an average of \$1,347.46 per mile; while the ten roads last named expended \$11,452,295 on 15,771 miles one year, equal to an average of but \$732.50 per mile. These figures are suggestive, especially in their bearing upon results, net earnings, dividends, and other questions.

The principal properties included in the special inspections made by this office have been those of the Union Pacific, Central Pacific, Southern Pacific, Atlantic and Pacific, and Northern Pacific Companies, and of lines connecting therewith, aggregating over 6,000 miles of railroad. On all of these properties "extension" and "improvement" have been the order of the day. Branch lines have been and are in process of construction, and still more are projected. Steel rails are being largely substituted for iron rails; ties are kept well renewed; grades are being reduced and bad locations remedied; trestles are being filled, and road-beds widened and ballasted; shops and station-houses are being enlarged; new and improved machinery has been purchased; equipment has been increased so as to meet the requirements of traffic. And in all this, while economy has been studied, safety of travel and public convenience have not been overlooked. At no previous time in the history of these great enterprises has the value of the properties been so assured or their prospects been so good for benefiting their owners, paying their debts, and serving the people better and more cheaply. As the Great West, and the Northwest, the Pacific Slope and the Southwest fill up with settlers there must come business enough for each one of these great trunk lines—Northern, Central, and Southern—without invading each other's territory or grasping for business in any way other than by that of legitimate and actual competition.

The particular property of each of these companies will be referred to, however, in another part of the report and in greater detail.

ACCIDENTS ON RAILROADS AND THEIR PREVENTION.

Before dismissing general reference to the inspections of railroad property made by this office, attention is invited to the remarks of Mr. Nichols, the railroad engineer, in regard to the important subject of railroad accidents and their prevention.

The time has undoubtedly arrived when the National government should take some action looking to the safety of life and property on railroads. Although there have been no accidents of a serious character on the Pacific Railroads during the year, or, as a matter of fact, for many years, every precaution should be taken by the government to prevent their occurrence.

The Hon. Isaac F. Redfield, chief justice of Vermont, writing in 1873, says:

If we refer to the numerous acts of Congress for the security of property and life connected with commerce, and for its encouragement and protection in all its relations and departments, and reflect how almost exclusively the entire subject is brought under the supervision and control of Congress, we shall find slight ground to question

that such supervision will be extended to the inter-State commerce upon railways, and that it may rightfully be so extended, since there seems to be no other mode of rendering this inter-State railway traffic safe and just to passengers and the owners of freight, and at the same time reasonably remunerative to the companies.

The Supreme Court of the United States, in affirming the decree of the lower court in the case *Western Union Telegraph Company v. Pensacola Telegraph Company* (96 Supreme Court Reports 8), used the following language:

Congress has power "to regulate commerce with foreign nations and among the several States" (Const. art. 1, sect. 8, par. 3); and "to establish post-offices and post-roads" (*id.*, par. 7). The Constitution of the United States and the laws made in pursuance thereof are the supreme law of the land (art. 6, paragraph 2). A law of Congress made in pursuance of the Constitution, suspends or overrules all State statutes with which it is in conflict.

Since the case of *Gibbons v. Ogden* (9 Wheat., 1), it has never been doubted that commercial intercourse is an element of commerce which comes within the regulating power of Congress. Post-offices and post-roads are established to facilitate the transmission of intelligence. Both commerce and the postal service are placed within the power of Congress, because, being national in their operation, they should be under the protecting care of the national government.

The powers thus granted are not confined to the instrumentalities of commerce or the postal service known or in use when the constitution was adopted, but they keep pace with the progress of the country, and adapt themselves to the new developments of time and circumstances. They extend from the horse with its rider to the stage-coach, from the sailing vessel to the steamboat, from the coach and the steamboat to the railroad, and from the railroad to the telegraph, as these new agencies are successively brought into use to meet the demands of increasing population and wealth. They were intended for the government of the business to which they relate, at all times, and under all circumstances. As they were intrusted to the general government for the good of the nation, it is not only the right, but the duty of Congress to see to it, that intercourse among the States and the transmission of intelligence are not obstructed or unnecessarily encumbered by State legislation.

Professor Geo. L. Vose, writing on the subject of "Bridge Disasters in America—The Cause and the Remedy," in the *Railroad Gazette* of July 2, 1880, says:

To conclude: Thirty bridges on an average break down in the United States every year. No system of inspection or control at present existing has been able to detect in advance the defects in these structures or to prevent the disasters. A system practicable, simple, and inexpensive can be had, which, if properly carried out, will insure in nearly all cases, if not all, the public safety. It lies with the public to say whether or not it will have such a system.

The *Railroad Gazette* of September 17, 1880, contains the following in an editorial on this subject:

The investigation of railroad accidents seems not likely soon to be undertaken by governmental authority, either state or national in this country, though if it could be done thoroughly and intelligently it would be very desirable. Even in cases where death has been caused by criminal negligence, there is very rarely any investigation which is of much value to those who are studying how best to avoid accidents. A coroner's inquest is only in very rare instances of any value whatever, and it does not even make the clear statement of the facts attending an accident which would enable a railroad man to form a judgment for himself, while in the nature of things it must be altogether an accident, if its judgment is worth anything. And in the comparatively infrequent cases when men have been tried in the courts on charges of having caused accidents by criminal negligence, if there has been any valuable investigation the record of it has usually not become public, or at least not accessible to railroad men, who would most profit by it.

Mr. Charles Francis Adams, jr., in his "Notes on Railroad Accidents," says in regard to this subject:

The lack of all reliable statistics as respects this wide field of inquiry has already been referred to. We have no trustworthy data. We do not know, with accuracy, even the number of miles of road operated; much less the number of passengers annually carried. * * * The number of passengers annually carried on the roads of a few of the States is reported with more or less accuracy, and averaging these the result

would seem to indicate that there are certainly not more than 350,000,000 passengers annually carried on the roads of all the States. There is something barbarous about such an approximation, and it is disgraceful that at this late day we should in America be forced to estimate the passenger movement on our railroads in much the same way that we guess at the population of Africa. Such, however, is the case. We are in this respect far in the rear of civilized communities. Taking, however, 350,000,000 as a fair approximation to our present annual passenger movement it will be observed that it is as nearly as may be half that of Great Britain. In Great Britain in 1878, there were 1,200 injuries to passengers from accidents to trains, and 675 in 1877. The average of the last eight years has been 1,226. If, therefore, the approximation of 800 a year for America is at all near the truth the percentage would seem to be considerably larger than that arrived at from the statistics of Great Britain. Meanwhile it is to be noted that while in Great Britain about 25 cases of injury are reported to each one of death, in America but four cases are reported to each death—a discrepancy which is extremely suggestive. Perhaps, however, the most valuable conclusion to be drawn from these figures is that in America we are as yet absolutely without any reliable railroad statistics on this subject at all.

The following statistical information in regard to *train accidents only*—omitting all others, and by which the majority of persons are killed and injured on railroads—is taken from the Railroad Gazette, of January 30, 1880, and although probably incomplete, is the best and most reliable that can be obtained.

Number of train accidents each month for seven years.

Months.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.	Average.
January.....	178	108	131	60	147	75	113	812	116
February.....	133	90	211	91	56	67	88	736	105
March.....	112	88	122	109	58	49	61	599	85
April.....	101	59	60	56	60	46	50	441	63
May.....	79	89	54	64	46	50	37	419	60
June.....	90	83	61	52	49	56	64	455	65
July.....	90	64	73	79	53	54	81	494	71
August.....	150	73	114	78	98	75	79	667	95
September.....	106	89	116	106	84	76	78	655	94
October.....	88	81	88	103	82	61	104	607	87
November.....	76	82	87	96	83	68	86	578	82
December.....	80	74	84	88	66	63	69	524	75
Totals.....	1,283	980	1,201	982	891	740	910	6,987	998

Classification of train accidents for seven years.

Kind.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.	Average.
Collisions.....	392	260	278	279	268	220	310	2,007	287
Derailments.....	815	654	840	655	581	481	557	4,583	655
Other accidents.....	76	66	83	48	42	39	43	397	56
Total.....	1,283	980	1,201	982	891	740	910	6,987	998

*Number of persons—passengers and employes—killed and injured by train accidents.**

	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.	Average.
Killed.....	276	204	234	328	214	204	185	1,645	235
Injured.....	1,172	778	1,107	1,097	1,047	756	709	6,066	953
Total.....	1,448	982	1,341	1,425	1,261	960	894	8,311	1,187

* Between January 1 and September 30, 1880, the returns of killed and wounded on the railways of Great Britain and Ireland show that 831 persons were killed and 4,791 injured, of which 82 of the killed were passengers and 506 of the wounded, the remainder being workmen in the employ of the railroads.

REPORT OF THE AUDITOR OF RAILROAD ACCOUNTS.

Number of train accidents resulting from defective road, track, or equipment.

Classification.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.	Average.
Cattle on track	54	45	51	46	43	30	35	304	43
Broken rail	111	42	107	50	46	17	56	429	61
Loose rail	13	16	40	43	41	29	19	201	29
Broken truck	7	8	15	10	8	13	11	72	10
Broken axle	31	18	44	40	52	20	21	226	32
Broken wheel	21	5	12	22	53	20	26	139	20
Broken tire			9		1		3	13	2
Broken bridge	11	22	26	20	21	21	17	138	20
Boiler explosions	16	14	26	19	15	11	17	118	17
Broken parallel or connecting rod	11	8	19	7	13	11	15	84	12
Cars burned while running	2	16	10	11	7	13	4	63	9
Failure of coupling	8	7	3	1	1	4	2	26	4
Totals	285	201	362	269	281	189	226	1,813	259

Number of train accidents resulting from defective management or discipline.

Character.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.	Average.
Rear collisions	187	131	141	159	159	142	206	1,125	181
Butting collisions	102	87	104	94	96	70	86	639	91
Crossing collisions	81	19	18	15	13	7	17	120	17
Misplaced switch	72	67	81	89	70	48	80	507	72
Unexplained	387	241	237	196	177	176	194	1,603	230
Total	779	545	581	553	515	443	583	3,999	571

From other sources the following approximate statement of the number of passengers carried and of the number of passengers carried one mile is made up, viz:

Year.	Miles operated.	Passengers carried.	Passengers carried one mile.
1873	70,000	320,000,000	8,800,000,000
1874	72,000	335,000,000	9,000,000,000
1875	74,000	340,000,000	9,000,000,000
1876	77,000	380,000,000	10,800,000,000
1877	79,000	335,000,000	8,800,000,000
1878	82,000	325,000,000	8,300,000,000
1879	87,000	350,000,000	9,200,000,000
Total seven years	541,000	2,385,000,000	64,000,000,000
Average per year	77,286	340,714,286	9,142,857,142

These figures and tables, although approximate merely, show that of the passengers who travel by railroad in the United States, including employes on trains, in every million and one-half carried, *one* is killed and *four* are injured; or, to state it differently, that in EVERY FORTY MILLION persons CARRIED ONE MILE, ONE IS KILLED AND FOUR ARE INJURED!

The figures also show that about *one-fourth* of the train accidents are the result of *defects in property*, while *more than one-half* of them are the result of *carelessness, lack of discipline, or defective management*.

The Hon. James A. Garfield, of Ohio, introduced in the House of Representatives, on February 1, 1877, a bill entitled "A bill to provide for a more thorough investigation of accidents upon railroads." The bill authorized and requested the President to appoint a board of three commissioners from the Engineer Corps of the Army to inquire into the

number, causes, and means of prevention of accidents on railroads in the United States, and the number of persons killed or injured; and made it the duty of the commissioners to investigate accidents of an unusual character on railroads and to make a special report thereon. The board was also required to forward to the Secretary of the Treasury (!) at the close of each year a general report upon the subject of accidents upon railroads in the United States, the same to be submitted to Congress. The bill did not come up at that session, but was brought forward again in 1878. It was not reached, however, and went over as unfinished business.

The Hon. William W. Eaton, Senator from Connecticut, on December 2, 1879, introduced a bill "to protect life and property and to prevent accidents and delay to the mails on railroads and steamboats operated by steam power within the jurisdiction of the United States of America," and which is now pending. The main feature of the bill is, that railroad and steamboat companies doing interstate business are required to adopt and put into actual and continued use such inventions and improvements as may contribute to the comfort, security, and safety of passengers, &c., and to carry this into effect the bill provides for the appointment by the President of the United States of a board of five commissioners to determine and authorize (!) the use of such inventions, as well as to determine (!) the compensation or royalty to be paid for the same.

In view of the fact that much heavier locomotives and freight cars of much greater capacity are being introduced and used on Western as well as on Eastern railroads, it is of paramount importance that the factor of safety for all bridges keep pace with increased loads. In this particular the remarks of the engineer in his report on defective bridge structures are worthy of consideration.

This whole subject of "Accidents—their causes and remedy" is entitled to an early consideration by Congress. Three terrible disasters, of but recent occurrence, namely those of the Tay bridge in Scotland and the May's Landing and Pittsburgh yard collisions in this country, the first owing to defective structure, the second owing to defective equipment, and the third owing to defective management or discipline, urge careful and considerate action by the law-making power. But any law which omits some requirement for independent and untrammelled investigation, for thorough inspection of bridges, equipment, and signals, as well as complete statistical information, must necessarily fail to accomplish the main object in view, namely; assured safety to life and property on railroad trains.

CONTINUED IMPROVEMENT IN THE BUSINESS OF RAILROADS.

Not only as regards the railroads of the United States as a whole, but more particularly as to those in which the government is interested as creditor or grantor, has there been a surprising continuance of prosperity.

For the calendar year 1879, as compared with 1878, the gross earnings of nearly all the railroads in the United States show an increase of \$40,000,000, or about *eight per cent.*; the working expenses show an increase of \$7,500,000, or about *two and one-half per cent.*; and the net earnings show an increase of \$32,500,000, or more than *seventeen per cent.*; while the increased mileage has been about *six per cent.*, or nearly 4,800 miles. (Appendix T.)

A noticeable feature of this increased business is that it has occurred nearly altogether on the railroads of the Middle, Western, and South-

western States, the business of those in the Pacific, New England, and Southern States not having materially improved.

In Appendix M of my report for last year the passenger and freight business of a certain number of railroads east of the Mississippi and that of another certain number of railroads wholly or partially west of the Mississippi, aggregating some 12,000 miles each, were tabulated for the years 1873 to 1878 inclusive, the results shown being stated on page 6 of the report. These tables have been corrected and continued in this report. (Appendix S.) The following is a comparative statement for the calendar years 1879 and 1878 made up therefrom :

Comparative statement of business of certain railroads for 1878 and 1879. (See Appendix S.)

Items.	Western, or certain railroads wholly or partially west of the Mississippi River.			
	1879.	1878.	Increase.	Decrease.
Miles operated.....	12,919	12,947	872	.....
Passengers carried.....	17,949,000	17,617,000	332,000	.....
Passengers carried one mile.....	784,572,000	711,828,000	72,744,000	.....
Passenger earnings.....	\$21,429,000	\$20,341,000	\$1,088,000	.....
Rate per passenger per mile.....	2.73 cents.	2.86 cents.	.....	0.13 cents.
Tons of freight carried.....	21,618,000	18,367,000	3,251,000	.....
Tons of freight carried one mile.....	4,411,166,000	3,430,195,000	980,971,000	.....
Freight earnings.....	\$66,403,000	\$60,357,000	\$6,046,000	.....
Rate per ton of freight per mile.....	1.50 cents.	1.76 cents.	.....	0.26 cents.
Gross earnings.....	\$85,772,000	\$80,631,000	\$5,141,000	.....
Operating expenses.....	\$49,848,000	\$44,974,000	\$4,874,000	.....
Net earnings.....	\$45,924,000	\$44,057,000	\$1,867,000	.....

Items.	Eastern, or certain railroads east of the Mississippi River.			
	1879.	1878.	Increase.	Decrease.
Miles operated.....	12,716	12,364	352	.....
Passengers carried.....	84,752,000	80,118,000	4,634,000	.....
Passengers carried one mile.....	1,894,014,000	1,804,264,000	90,750,000	.....
Passenger earnings.....	\$41,130,000	\$41,233,000	.....	\$34,000
Rate per passenger per mile.....	2.12 cents.	2.29 cents.	.....	0.17 cents.
Tons of freight carried.....	87,924,000	69,678,000	18,246,000	.....
Tons of freight carried one mile.....	11,584,400,000	9,468,210,000	2,116,190,000	.....
Freight earnings.....	\$103,582,000	\$97,094,000	\$6,488,000	.....
Rate per ton of freight per mile.....	0.89 cents.	1.03 cents.	.....	0.14 cents.
Gross earnings.....	\$164,147,000	\$155,490,000	\$8,657,000	.....
Operating expenses.....	\$101,362,000	\$96,984,000	\$4,378,000	.....
Net earnings.....	\$62,785,000	\$58,506,000	\$4,279,000	.....

This statement is very suggestive on many points.

First. That while the ratio of *operating expenses* to *gross earnings* on these Western roads is, say, 52 per cent., and on the Eastern roads 62 per cent., the Eastern roads have done three times the work, at only double the cost.

Second. That both these Eastern and Western railroads have reduced their rate per ton per mile *fourteen per cent.*, and passenger rates about *seven per cent.*, on an average.

Third. That the *average haul*, both of freight and passengers, on the Western, is nearly double that on the Eastern roads.

Fourth. That the average rate *per ton per mile* on the Eastern roads

is down to the very low price of *less than nine-tenths of a cent*, and the rate *per passenger per mile* to *two and one-eighth cents*.

The course of business on the Union and Central Pacific Railroads for the eight years ending December 31, 1879, is shown in the following tabular statements. The statement showing the business of the Central Pacific is made up on a *currency basis*, in order to enable some comparison to be made with that of the Union Pacific and other roads, the greater portion of the business of the Central Pacific during the years prior to 1879 having been done in *coin*. A statement is also made, showing the course of business on the Kansas Pacific for the same period, from which it will be seen that this road is doing much better than heretofore.

Business of the Union Pacific Railroad for eight calendar years, 1872 to 1879, inclusive.

Items.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Miles operated.....	1, 038	1, 038	1, 038	1, 038	1, 038	1, 038	1, 038	1, 038
Passengers carried.....	165, 688	174, 894	198, 877	209, 834	202, 548	185, 891	188, 315	217, 100
Passengers carried 1 mile.....	80, 063, 871	85, 709, 834	105, 128, 266	132, 391, 343	128, 032, 924	107, 833, 371	98, 304, 250	100, 131, 148
Passenger earnings.....	\$4, 370, 312	\$3, 861, 204	\$5, 832, 588	\$4, 346, 014	\$4, 307, 662	\$3, 998, 757	\$3, 190, 370	\$3, 207, 910
Rate per passenger per mile.....	4. 18 cents.	4. 06 cents.	3. 76 cents.	3. 28 cents.	3. 36 cents.	3. 34 cents.	3. 31 cents.	3. 20 cents.
Tons of freight carried*.....	378, 650	482, 484	482, 896	501, 409	629, 947	716, 113	844, 019	892, 881
Tons of freight carried 1 mile*.....	178, 145, 755	223, 361, 542	292, 238, 657	289, 414, 869	292, 602, 076	324, 644, 870	368, 014, 081	438, 054, 140
Freight earnings.....	\$4, 537, 182	\$5, 628, 560	\$5, 136, 501	\$8, 983, 073	\$6, 568, 864	\$7, 218, 856	\$7, 700, 048	\$7, 828, 464
Rate per ton of freight per mile.....	2. 45 cents.	2. 25 cents.	1. 96 cents.	2. 22 cents.	2. 36 cents.	2. 16 cents.	2. 10 cents.	1. 79 cents.
Gross earnings.....	\$9, 451, 338	\$9, 775, 737	\$10, 631, 650	\$11, 345, 395	\$12, 176, 620	\$12, 171, 520	\$12, 520, 385	\$12, 353, 129
Operating expenses.....	4, 369, 306	4, 484, 514	4, 326, 474	4, 333, 611	4, 557, 972	4, 775, 135	4, 575, 679	4, 669, 354
Net earnings.....	4, 092, 032	5, 291, 243	5, 705, 176	7, 011, 784	7, 618, 648	7, 396, 385	7, 744, 686	7, 723, 575

* Commercial; company freight not included.

Business of the Central Pacific Railroad for eight calendar years, 1872 to 1879, inclusive, at currency values.

Items.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Miles operated.....	1, 176	1, 254	1, 266	1, 349	1, 424	1, 900	2, 119	2, 819
Passengers carried, rail.....	588, 883	658, 105	624, 449	678, 903	789, 702	1, 168, 935	1, 224, 586	1, 279, 418
Passengers carried, ferry.....	2, 415, 141	2, 621, 976	3, 238, 280	4, 083, 411	4, 862, 957	5, 661, 621	5, 754, 602	5, 562, 889
Total passengers carried.....	3, 003, 974	3, 280, 171	3, 862, 729	4, 762, 314	5, 772, 659	6, 830, 556	6, 979, 188	6, 842, 307
Passengers carried 1 mile.....	100, 420, 618	120, 838, 673	134, 318, 662	168, 334, 348	172, 639, 176	181, 715, 260	178, 773, 325	180, 773, 751
Passenger earnings.....	\$4, 303, 782	\$4, 707, 801	\$4, 988, 617	\$5, 897, 942	\$5, 908, 822	\$5, 635, 437	\$5, 319, 976	\$4, 918, 255
Rate per passenger per mile.....	4.28 cents.	3.89 cents.	3.71 cents.	3.51 cents.	3.42 cents.	3.10 cents.	2.86 cents.	2.72 cents.
Tons of freight carried*.....	746, 153	808, 601	905, 304	923, 783	1, 114, 045	1, 048, 779	1, 389, 944	1, 490, 555
Tons of freight carried one mile*.....	190, 516, 507	203, 042, 384	242, 151, 312	272, 182, 415	310, 529, 070	309, 733, 968	339, 013, 885	389, 021, 573
Freight earnings*.....	\$7, 461, 233	\$8, 107, 602	\$8, 483, 311	\$9, 838, 304	\$10, 773, 618	\$10, 042, 611	\$10, 878, 483	\$10, 884, 573
Rate per ton of freight per mile.....	3.91 cents.	3.99 cents.	3.51 cents.	3.65 cents.	3.47 cents.	3.24 cents.	3.21 cents.	2.74 cents.
Gross earnings.....	\$12, 734, 730	\$13, 851, 489	\$14, 531, 355	\$17, 021, 016	\$18, 146, 944	\$18, 522, 229	\$17, 649, 947	\$17, 133, 163
Operating expenses†.....	6, 148, 912	6, 256, 100	6, 546, 809	8, 464, 998	9, 884, 545	12, 594, 937	11, 321, 491	11, 126, 247
Net earnings.....	6, 585, 818	7, 595, 389	7, 984, 546	8, 556, 018	8, 262, 399	5, 927, 292	6, 328, 456	6, 026, 916

* Commercially company's not included.

† Includes rentals and taxes.

Business of the Kansas Pacific Railway for eight calendar years—1872 to 1879, inclusive.

Items.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Miles operated.....	673	673	673	673	673	673	673	673
Passengers carried.....	176,182	173,651	138,835	123,263	124,740	143,117	198,173	290,228
Passengers carried one mile.....	20,664,369	23,589,686	22,025,044	19,292,049	18,232,525	18,596,167	22,173,135	35,874,444
Passenger earnings.....	\$1,172,624	\$1,242,206	\$1,111,706	\$933,491	\$766,450	\$690,062	\$782,806	\$1,136,466
Rate per passenger per mile.....	5.67 cents.	5.37 cents.	5.03 cents.	4.84 cents.	4.20 cents.	3.64 cents.	3.52 cents.	3.17 cents.
Tons of freight carried.....	348,966	283,405	247,203	251,064	289,992	337,520	467,736	518,280
Tons of freight carried one mile.....	72,366,357	61,967,443	62,474,805	72,119,554	71,540,064	85,393,211	102,013,144	126,248,910
Freight earnings.....	\$2,294,299	\$2,077,169	\$1,965,655	\$2,157,166	\$1,968,218	\$2,115,630	\$2,495,652	\$3,091,664
Rate per ton of freight per mile.....	3.17 cents.	3.33 cents.	3.15 cents.	2.99 cents.	2.75 cents.	2.43 cents.	2.46 cents.	2.39 cents.
Gross earnings.....	\$3,723,713	\$3,563,299	\$3,305,664	\$3,383,760	\$3,000,801	\$3,284,734	\$3,610,224	\$4,663,301
Operating expenses.....	2,423,833	2,344,417	1,731,804	1,963,162	1,860,338	2,056,638	2,290,759	2,738,067
Net earnings.....	1,299,880	1,318,882	1,624,860	1,390,578	1,140,463	1,228,096	1,319,465	1,924,614

From these tables it will be seen that the passenger business of the Union and Central Pacific reached its maximum in 1875—the earnings aggregating \$10,243,956 in that year, and the passenger mileage 300,927,691, the average rate per mile being three and four-tenths cents. Since then the business has gradually decreased, until in 1879 the aggregate earnings were but \$8,127,165, the mileage but 280,924,899, and the average rate per mile two and eighty-nine one-hundredths cents.

The freight business, on the contrary, reached its maximum in 1879—the earnings of the roads from that source being \$18,761,037, the ton mileage being 835,075,722 (exclusive of company freight), and the average rate being two and one-quarter cents per ton per mile, as against \$15,931,379 of earnings and 541,597,404 tons carried one mile in 1875, when the average rate per ton per mile was nearly three (3) cents.

The business of the Sioux City and Pacific and Central Branch Union Pacific Railroads also continues to improve, and to such an extent that there will be an annual payment hereafter, from both of these roads, as “five per cent. of net earnings,” to be applied on the debt due the United States. The following statements show the course of business on these two roads :

Sioux City and Pacific Railroad and leased lines.

[Calendar years.]

	1875.	1876.	1877.	1878.	1879.
Miles operated	158	158	158	158	171
Gross earnings	\$311,719	\$376,515	\$383,110	\$414,901	\$479,722
Total expenses*	308,346	287,431	312,317	338,811	337,413
Net earnings	8,373	89,084	70,793	81,090	142,309

Central Branch Union Pacific Railroad and leased lines.

[Calendar years.]

	1875.	1876.	1877.	1878.	1879.
Miles operated	100	100	120	172	237
Gross earnings	\$115,718	\$172,853	\$239,437	\$324,954	\$397,964
Operating expenses	89,339	122,857	177,039	384,695	611,045
Net earnings	26,379	49,996	62,398	240,259	386,939

The business of the “Central Branch” as well as that of other roads has been materially affected this year by reason of the severe drought in Kansas west of the one hundredth meridian.

Among the other railroads, the operations of which have been reported to this office, are the Southern Pacific; the Northern Pacific; the Saint Louis and San Francisco (successor to the Atlantic and Pacific in Missouri); the Oregon and California, and Oregon Central; the Atchison, Topeka and Santa Fé; the Missouri, Kansas, and Texas; the Saint Louis, Iron Mountain and Southern; the Missouri Pacific; the Kansas City, Lawrence and Southern; the Little Rock and Fort Smith; the Memphis and Little Rock; the Chicago, Rock Island and Pacific; the Iowa Falls and Sioux City and Dubuque and Sioux City (operated

* Including taxes and new construction and equipment.

by the Illinois Central); the Cedar Rapids and Missouri River and the Winona and Saint Peter (operated by the Chicago and Northwestern the Chicago, Milwaukee and Saint Paul; the Saint Paul and Duluth; the Vicksburg, Shreveport and Pacific; and the Texas and Pacific.

With the exception of the Oregon railroads, business for 1879, and also that of the current year, has largely increased on nearly all of the railroads enumerated; more notably on the Atchison, Topeka and Santa Fé; the Saint Louis, Iron Mountain and Southern; the Saint Louis and San Francisco; the Missouri, Kansas and Texas; the Little Rock and Fort Smith; and the Vicksburg, Shreveport and Pacific; the details of which are given in Table No. 11 of this report.

Some of the railroad companies whose roads are included in the act creating the bureau have neglected and refused to furnish the reports called for. Among them are the Burlington and Missouri River Railroad Company in Nebraska; the Chicago, Burlington and Quincy Railroad Company; the Hannibal and Saint Joseph Railroad Company; the Chicago, Saint Paul, Minneapolis and Omaha Railway Company; and the Saint Paul, Minneapolis and Manitoba Railway Company; all of which have received valuable grants from the United States. Some other process than a suit for the penalty prescribed is desirable, as the time within which such suits could be determined would probably extend over some years. If patents for lands were refused to such companies as do not comply with the law, it would correspond with the law in regard to companies who fail to pay the expenses of commissioners, engineers, and other agents appointed to examine railroads, and might be effective.

CONDITION OF THE BOND AND INTEREST ACCOUNTS.

The public debt statement issued by the Treasury Department July 1, 1880, shows the condition of the accounts with the several Pacific Railroad companies so far as regards moneys which have been actually covered into their credit, but takes no account of moneys in the sinking-fund held by the Treasurer of the United States or of the compensation for services performed, but not at that time settled by the accounting officers. The following extracts from the statement are here given:

Name of railway.	Principal outstanding.	Interest accrued and not yet paid.	Interest paid by the United States.	Interest repaid by companies.		Balance of interest paid by the United States.
				By transportation service.	By cash payments, 5 per cent. net earnings.	
Central Pacific.....	\$25,885,120 00	\$776,553 60	\$18,016,680 07	\$3,200,380 64	\$648,271 06	\$14,168,018 47
Kansas Pacific.....	6,303,000 00	180,090 00	4,805,708 09	2,447,397 28	.....	2,358,305 81
Union Pacific.....	27,236,512 00	817,095 36	19,238,182 89	7,804,484 37	.....	11,433,698 52
Central Branch U. P.....	1,600,000 00	48,000 00	1,213,808 26	47,621 69	6,926 91	1,150,250 66
Western Pacific.....	1,970,560 00	59,116 80	1,254,431 34	9,367 00	.....	1,245,064 34
Sioux City and Pacific.....	1,628,320 00	48,849 60	1,122,350 29	106,632 57	.....	1,016,317 72
Totals.....	64,623,512 00	1,938,705 36	45,651,155 94	14,615,292 55	655,198 87	31,380,664 32

As regards the debt owing to the United States by all of the subsidized Pacific Railroads—

Appendix O of this report shows the following :

Total debt, principal and interest, to June 30, 1880.....	\$112,213,373 30
Total credits, transportation and money in the Treasury, to June 30, 1880.....	15,385,292 13
Balance yet owing to the United States	<u>\$96,828,112 17</u>

CONDITION OF THE TRANSPORTATION ACCOUNTS.

Appendix P of this report shows in detail the condition of these accounts with each of the indebted Pacific Railroads, from which the following summary is made:

Transportation services as per companies' books	\$20,846,366 57
Transportation services on roads not subsidized	1,398,292 15
Transportation services on subsidized roads	19,448,074 42
*One-half paid to companies prior to 1873	\$4,295,187 98
One-half retained and applied prior to 1873	4,204,471 03
Amount settled for prior to act of 1873	8,499,659 01
Remainder, applicable to "repayment of interest," to the payment of "five per centum of net earnings," to the payment of "requirement for sinking-fund" and payable to the companies, respectively	10,948,415 41
One-half applicable to repayment of interest	\$5,474,207 72
Of the "other half" there is applicable—	
To payment of "five per cent. of net earnings"	4,354,821 25
To payment of "sinking-fund requirement"	1,081,391 64
To payment of "Sioux City and Pacific Company"	37,994 80
Total as above	10,948,415 41

Of the transportation on *roads not subsidized*, amounting to \$1,398,292.15, there is payable on account of "Five per cent. of net earnings"—equivalent to a cash payment by the companies—\$738,151.58; payable on account of "requirement for sinking-fund"—Union Pacific, \$23,073.73; and payable to the companies—Kansas Pacific (now Union Pacific), \$621,844.11, and Sioux City and Pacific, \$15,222.73, together amounting to \$637,066.84.

The cash payments which have been required from the companies in addition to the retention of the entire compensation for services are as follows:

Central Pacific	\$1,058,677 79
Central Branch Union Pacific	1,953 77
Total	<u>\$1,060,631 56</u>

The Central Pacific Railroad Company has deposited the above amount in the Treasury, viz: \$1,058,677.79, of which the last payments, \$229,076.32, have been deposited under protest against their investment in "currency sixes" at 20 or 30 per cent. premium.

CONDITION OF THE "FIVE PER CENTUM OF NET EARNINGS" ACCOUNTS.

As shown in Appendix P, the total amount of "five per centum of net earnings" of the subsidized Pacific Railroads to December 31, 1879, is \$5,353,150.08.

* This amount and the following one vary from last year's statement owing to payments to and receipts from some of the companies.

In my last annual report (page 19) the total amount of this account to December 31, 1878, was stated as \$4,716,265.23.

The increase is accounted for in the following manner, viz :

Union Pacific, calendar year 1879	\$306,563 22
Central Pacific, calendar year 1879	179,912 78
Kansas Pacific, calendar year 1879	70,000 00
Central Branch Union Pacific, calendar year 1879	19,346 96
Sioux City and Pacific, calendar year 1879	4,000 00
Total for the year 1879	579,842 96
Kansas Pacific, for total period to December 31, 1878, in addition to last year's estimate	52,114 98
Central Branch Union Pacific, for 1878, as agreed upon in suit in Court of Claims	6,926 91
Total additional 5 per cent. of net earnings	\$638,884 85

Detailed statements of the earnings and expenses of the Kansas Pacific Railway for the ten years ending November 1, 1878, are given in Appendix Q; also, of the Sioux City and Pacific Railroad from November 1, 1874, to June 30, 1880; and a general statement of the earnings and expenses of the Central Branch Union Pacific for 1878.

As to the Kansas Pacific Railway, the first detailed statement, marked *a*, showed "net earnings" of \$6,708,314.81, upon which \$335,415.75—"five per cent. of net earnings"—was payable, being for those years only in which there was a surplus remaining after the payment of interest on first-mortgage bonds. The years 1870 and 1871 having no surplus of that kind, no "five per cent." was payable for those years.

The correctness of the apportionment of "construction" and other items being doubted somewhat, a re-examination of that portion of the expenditures was made with results as shown in statement marked *b*, which, being used in place of the amounts as given in statement *a*, showed "net earnings" for the same period, amounting to \$6,818,044.03, upon which "five per centum" was \$340,902.20.

This amount, however, did not appear to give the United States a fair and equitable proportion of the business, although it was reached in strict compliance with the principles laid down by the Supreme Court in what are known as the "five per cent." cases; that is, a *pro rata* according to mileage was made the basis of apportionment, no actual accounts having been kept for the years prior to November, 1876.

From November 21, 1876, when the road passed into the hands of receivers, to December 31, 1879, separate and correct accounts *were kept* for each mortgage division operated. Upon those accounts a statement was prepared in this office, and is given in appendix Q, statement marked *d*, from which it appeared that the divisions of the road upon which the United States subsidy bonds were issued, the first and second mortgage divisions—394 miles from Kansas City westward—were entitled to, as they had actually earned during a period of more than three years, forty-one and six one-hundredths (41.06) per cent. on and over the amount found upon the mileage proportion of business.

A statement, *e*, of the appendix, was therefore prepared on the basis found by statement *d*, by which it appears that the "net earnings" of the subsidized 394 miles of the Kansas Pacific Railway for the ten years amounts to \$9,467,317.26, of which, however, \$425,017.27, being the net earnings for 1870 and 1871, are not subject to the payment of "five per cent.," leaving the net amount subject to "five per cent." \$9,042,299.99, five per cent. of which is \$452,114.99.

* Estimated.

Prior to 1879, the Sioux City and Pacific Railroad had not realized any net earnings which were subject to the payment of "five per cent.," as will be seen by the detailed statement given in appendix Q, the interest payment on first mortgage bonds being in excess of the amount of net earnings up to that time.

The statement given in appendix Q, showing the earnings and expenses of the Central Branch Union Pacific Railroad for the calendar year 1878, gives net earnings for the 100 miles of subsidized road as \$138,538.27, "five per cent." of which is \$6,926.91, which amount was deducted from the amount of the judgment of the Court of Claims in a suit brought by the company—\$25,521.04—the company being paid the difference, \$18,594.13, in money.

CONDITION OF THE SINKING-FUND ACCOUNTS.

Appendix R of this report shows in detail the condition of the sinking funds of the Union and Central Pacific companies respectively held by the Treasurer of the United States under the act of Congress approved May 7, 1878.

The accounts of these two companies have been examined in order to arrive at a settlement under the law, for the periods of six months—July to December, 1878—and of twelve months from January to December, inclusive, 1879. The following statement shows the amount of compensation for services rendered which is applicable to the sinking-funds.

Period.	Union Pacific.	Central Pacific.
July 1 to December 31, 1878	\$294, 158 10	\$123, 852 02
January 1 to December 31, 1879	574, 844 00	226, 378 36
Total	869, 002 10	350, 230 38

The amount of cash or additional payment required from both companies for the sinking-funds is as follows:

Period.	Union Pacific.	Central Pacific.
July 1 to December 31, 1878	\$158, 818 37	\$181, 329 51
January 1 to December 31, 1879	76, 644 89	266, 894 42
Total	235, 463 26	448, 223 93
Grand total	1, 104, 465 36	798, 454 31

The amount in the sinking-fund June 30, 1880, as shown by report furnished this office by the Treasury Department, was as follows, viz:

Union Pacific Company	\$545, 282 34
Central Pacific Company	569, 487 37
Total	1, 114, 769 71

The investment of these sinking-funds is reported as follows:

Character of bonds.	Union Pacific.	Central Pacific.
Fixed loan of 1881, 5 per cent.	\$258, 450 00	\$194, 900 00
Fixed loan of 1907, 4 per cent.	31, 950 00	196, 300 00
Agency notes, 6 per cent.	192, 000 00	119, 000 00
Principal	480, 400 00	512, 200 00
Premium paid	64, 855 43	57, 285 73
Total cost	545, 255 43	569, 485 73

The amount of premium paid is so large that the companies have protested against investment at such heavy cost. The "currency sixes" purchased have been as follows :

	Premium.
\$42,000, at 125	\$10,500
33,000, at 126	8,580
70,000, at 127½	19,950
166,000, at 129½	48,970
311,000 (averaging nearly) 128.30	88,000

The honorable the Secretary of the Treasury, in December, 1879, and again in June, 1880, informed Congress of the difficulties which lay in the way of a just and profitable investment of these moneys, the funded loan of 1881, five per cent. bonds, having so short a time to run ; but the session closed without any action being taken, and the investment was made in "currency sixes," at that large premium, as a better investment than was offered by any other United States bond, to which the law limited the Secretary of the Treasury. The first mortgage bonds of the company—first payable from the sinking fund—are undoubtedly the best bond investment for this fund ; but better than any investment in bonds, which is always more or less liable to influence the market value of the securities sought, the amounts as covered in to these sinking funds should be credited with interest at, say, six (6) per cent. per annum payable semi-annually. This plan would make the investment *secure*, would avoid all question of market influence, and would pay the companies a sum on the investment much nearer that which they could obtain by investing the moneys themselves. These sinking fund moneys belong to the companies entirely, the United States bonds having no lien whatever upon the one-half of transportation compensation devoted to this purpose, *only on the other half*, which is, and has been, regularly applied to the payment of the bonds and interest under act of July 2, 1864 (sec. 5, 13 U. S. Statutes, 359).

In my last annual report, page 21, it was shown that, owing to delays in settlement, large sums due these companies and payable into the sinking-funds remained uncredited, and of course were unavailable for investment, to the great detriment of their interest account. Excepting compensation for mail-service, it is quite within bounds to say that the average time required for compensation for service to be passed to the credit of the companies is not less than one year! It is stated on reliable authority that on the 30th of June, 1880, transportation accounts of the Union Pacific Railway Company to the amount of over \$800,000 for services performed prior to that date, were somewhere in transit to the accounting officers, having left the company's hands months and perhaps years before. With a view to obtaining correct information as to this matter, request was made of the several departments of the government, on October 9, 1880, for a statement of the amount of accounts of the Pacific Railroad Companies for services prior to July 1, 1880, then held by the several bureaus and departments. In reply to these requests reports have been received from all departments except that of the Post-Office and those of the chief quartermasters at Saint Louis, Omaha, San Francisco, and Leavenworth.

The amount of transportation rendered by the companies as shown in

Appendix P. to December 31, 1879, is	\$20,846,366 57
Adding to this service for six months, to June 30, 1880, say	1,089,353 31
Makes total service performed	21,935,719 88
Less amount in controversy for mail service on Union Pacific, February, 1876, to June, 1880	1,023,151 40
Approximate amount of total service to June 30, 1880	20,912,568 48

Deduct—

Amount paid companies in money.....	\$4,295,187 98	
Amount covered into the Treasury to June 30, 1880, as per debt statement.....	13,615,292 55	\$17,910,480 53

Difference, accounts unsettled.....	3,002,067 95	
Accounts held by departments and accounting officers October, 1880..	1,212,152 64	

In the hands of administrative officers, chief quartermasters, quartermasters, &c.....	1,789,935 31	
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Railroad companies generally manage to settle their accounts with each other within sixty days after the close of a month's business; many of them in a much shorter time than that. Among the accounts remaining in the accounting officers' hands unsettled, some are for service rendered in 1873, and some for service in 1876 and 1877. Even though these companies cannot be paid the money found due, that is not a valid reason why their accounts should remain unsettled.

DEPARTMENTAL CIRCULARS AFFECTING PACIFIC AND OTHER RAILROADS.

Appendix D, of this report, contains, among others, an important circular issued by the Treasury Department November 29, 1879, being in the nature of a notice to all government officers and employes that no money payments can be made to any of the Pacific Railroads which have been subsidized with bonds, but that orders for transportation must be obtained from the proper authority. The roads, their termini, and distances being given, no person can hereafter claim ignorance of the provisions of law, and the accounting officers of the Treasury disallow all payments made in contravention thereof. In regard to this circular there are two questions yet undecided by the Supreme Court: first, that although the Missouri River bridge at Omaha, and its approaches on both sides of the river, have been decided to be a part of the Union Pacific Railroad, it has not yet been determined whether the compensation for services over this portion of the road can be withheld, inasmuch as it has *not been subsidized* in any way; second, as to that portion of the Kansas Pacific extending from the 394th mile-post to Denver, Colo., the same question arises. A suit has been instituted by the company—Union Pacific Railway Company (consolidated) *vs.* United States (Court of Claims No. 12380)—to test this question in regard to that portion of the Kansas Pacific above referred to, and which it is hoped will be determined during the present term of the Supreme Court.

Another circular, given in the same appendix, was issued by the Treasury Department on June 24, 1880, in which the opinion of the Attorney-General, dated June 18, 1880, is published for the information of all concerned. This opinion relates to the retention of compensation due Pacific Railroad Companies for services rendered on roads owned, leased, *controlled*, or operated by them, as well as on roads which have been subsidized with bonds. All of these companies—the Union Pacific Railway Company, the Central Pacific Railroad Company, the Sioux City and Pacific Railroad Company, and the Central Branch Union Pacific Railroad Company—operate roads other than those subsidized, on which the government is entitled to transportation service in the same way as any private person is, that is, *by paying for it*, except in any special case, such as the California and Oregon road, on which troops and military supplies are to be transported free of charge when so required by the United States. A suit has been instituted in the Court of Claims—Central

Branch Union Pacific Railroad Company *vs.* United States (No. 12381)—to recover the compensation for service on a leased line, withheld in accordance with the above-mentioned opinion. For the reason that the Supreme Court, in rendering its opinion in the Denver Pacific case (see page 172 of my last report), argued that as that company did not receive any bonds and was not liable for any debt of the Kansas Pacific Railway, compensation could not be withheld, it may be inferred, on the other hand, that as the companies which *did receive bonds are indebted* to the United States, therefore the right of retention applies to compensation for any services rendered by them. But it is better that the question be judicially determined, and that by the court of last resort.

General Order No. 69, issued by order of General Sherman from the Adjutant-General's Office September 30, 1880, is given in the same appendix (D), but without the tables. This circular gives instructions and accompanying tables of land-grant and subsidized railroads, revised and corrected, for the guidance and information of Army officers and employés. With a view to aid the several departments of the government by giving the fullest information in this respect, Appendixes A, B, and C of this report have been carefully prepared and revised, and it is believed will be found to agree with the circular of the War Department in all material points.

FORMS OF REPORT NOW IN USE BY THIS OFFICE.

No important change has been made in the forms of report required by this office. Appendix E contains blanks of all the forms now used.

In the report of "train accidents," a classified list is required, giving "casualties" and "resulting expenses." Should any law be passed requiring statistical information to be furnished by railroad companies in regard to accidents, it is suggested that some such report as this would serve the purpose.

The classification of "operating expenses" has been changed merely as to their order. In the present form, the footing of the first five items gives amount ordinarily called "conducting transportation"; the next two give that of "maintenance of way"; the next two "motive power"; the next one "maintenance of cars"; and the following three items give "general expenses." With a view to arriving at some more accurate results in regard to cost of transportation of various kinds, the items composing this classification of "operating expenses" have been arranged in the following manner, namely:

Station expenses as "terminal."	
Train service and supplies.....	} as dependent on "train mileage."
Casualties	
Motive power.....	
Service and supplies for cars.....	} as dependent on "car mileage."
Car service or rent of cars.....	
Maintenance of cars.....	
Maintenance of track.....	} as dependent on weight of engines, cars,
Fuel and water for locomotives.....	
Maintenance of roadway and buildings	} as "fixed expenses."
Insurance and losses by fire	
Taxes.....	
Administration and general expenses..	

These classifications and distinctions are based upon the methods adopted by Col. T. M. R. Talcott, general superintendent of the Richmond and Danville Railroad Company, in his annual reports, which are probably the most exact and scientific made by any company.

LAWS OF THE UNITED STATES AFFECTING RAILROADS AND TELE-
GRAPHS.

For convenience and for the information of all branches of the government it has been deemed advisable to publish certain laws affecting railroads and telegraphs. In my last annual report a compilation of the laws relating to the Pacific Railroad—the subsidized line and branches—was given as Appendix C, and has been found useful for reference.

Appendix F contains laws enacted by the Forty-sixth Congress which in any way affect the Pacific Railroad Companies.

Appendix G is a compilation of the laws relating to the Northern Pacific, Atlantic and Pacific, Texas and Pacific, Southern Pacific, and Oregon Railroad Companies. The charter acts of the Northern Pacific, Atlantic and Pacific, and Texas and Pacific Companies are included in the compilation, as well as all amendatory laws.

Appendix H is a compilation of the general laws of the United States affecting all railroads, and is composed principally of sections of the Revised Statutes.

Appendix I gives United States laws relating to the telegraph and telegraph companies. The complications and resulting litigation which have arisen between the Union Pacific Railway Company and the Western Union Telegraph Company have brought into considerable prominence all legislation in regard to telegraphs. The government being interested in the use of the telegraph, not only on the subsidized railroads, but all over the United States, these laws have been compiled for convenient reference. The circulars of the Post-Office Department, regulating charges for telegraphic service, have also been published with departmental circulars—Appendix D.

RECENT DECISIONS OF UNITED STATES COURTS.

Among the recent decisions of the Supreme Court of the United States affecting railroad companies, none has probably been so important as that rendered at the October term 1879, in the case of *Thomas et al. vs. West Jersey Railroad Company*—a case carried up on error from the circuit court of the eastern district of Pennsylvania. The decision of the Supreme Court is given in full in Appendix L.

In this case the lower court held that the contract entered into between Thomas and others and the Millville and Glassboro' Railroad Company, on October 8, 1863, whereby the railroad was leased for twenty years to Thomas and his partners, was void, such a contract being *ultra vires* of the company.

In affirming the judgment of the lower court, the Supreme Court says:

Where a corporation, like a railroad company, has granted to it by charter a franchise intended, in large measure, to be exercised for the public good, the due performance of those functions being the consideration of the public grant, any contract which disables the corporation from performing those functions [or] which undertakes without the consent of the State to transfer to others the rights and powers conferred by the charter, and to relieve the grantees of the burden which it imposes, is a violation of the contract with the State, and is void as against public policy.

The court further said in regard to the mention of "lessees," in an act of the legislature passed subsequently to the date of the contract:

The mention of the lessees no more implies a ratification of the contract of lease than the word "directors" would imply a disapproval of the contract. It is not by such an incidental use of the word "lessees" * * * that a contract unauthorized by the charter and forbidden by public policy is to be made valid and ratified by the State.

In regard to the executed and unexecuted part of the contract, the court said :

In regard to corporations, the rule has been well laid down by Comstock, C. J., in *Parish v. Wheeler* (22 N. Y., 494), that the executed dealings of corporations must be allowed to stand for and against both parties when the plainest rules of good faith require it.

In regard to the rescinding and canceling of such illegal or unauthorized contracts and leases, the court held :

It was the duty of the company to rescind or abandon it at the earliest moment. This duty was independent of the clause in the contract which gave them the right to do it. Though they delayed its performance for several years, it was nevertheless a rightful act when it was done.

In this connection it may be stated that the charter acts of the several Pacific Railroad Companies—Union Pacific, Northern Pacific, Atlantic and Pacific, and Texas and Pacific—do not give any authority or power to lease away any of their property or franchises, or to acquire by lease from any other company or person the right to operate other property ; and under the above decision of the Supreme Court any such leases should be rescinded and canceled. The telegraph, express, and other contracts in which the legitimate business of a railroad company has been leased to others, must apparently be canceled under this decision. There is a reasonable doubt, however, as to the sleeping-car and hotel-car business, the transportation of passengers being the legitimate business of the carrier, not the sleeping or eating conveniences which passengers may or may not require.

The opinion rendered by the circuit court of the United States for the district of Missouri in the telegraph case, *Western Union Telegraph Company v. Union Pacific Railway Company et al.*, is also given in Appendix L. The ultimate result of these suits cannot, in the light of the decision of the Supreme Court in the case of *Thomas v. West Jersey Railroad Company*, be otherwise than to place the telegraph and its business in the hands of the railway company, chartered by Congress for that especial purpose, and without any authority to avoid the operation of the same by lease or otherwise. The right of the United States to retain all of the compensation for services on the Union Pacific and one-half on the Kansas Pacific telegraph lines, and to 5 per cent. of the net earnings on the latter and 25 per cent. of the net earnings on the former, is believed to be obligatory upon the Union Pacific Railway Company or the lessees of the property.

Appendix M contains an important decision of the United States Court of Claims affecting all land-grant railroads on which the United States is entitled to transportation of troops and supplies "free of toll or other charge." The case is that of the *Atchison, Topeka and Santa Fé Railroad Company v. The United States*. (Court of Claims No. 11471.) The case has been pending since December, 1876, and in itself involves \$176,499.64—the amount claimed by the company for transportation to November 30, 1876. Indirectly, however, the amount involved in the decision can only be counted by millions, as it covers government transportation for all future time on some forty or more railroads in the United States.

After a careful and elaborate discussion of the several questions presented, legal and technical, Mr. Justice Davis, who delivered the opinion, says :

In view of these different results, obtained from independent calculations, all approximating to an equal division of the gross earnings between the road and service,

we can have no doubt that when Congress in 1879 authorized the payment of 50 per cent. of the approved bills of the land-grant roads, it intended to give its assent to the principle that 50 per cent. of the gross earnings is on the whole a just remuneration for the services and the profits which we have included in this computation.

The exact proportion between the cost of a road and the cost of its equipment varies in different roads and in the same roads at different times. But in view of the obvious necessity of establishing a fixed relation to govern current payments for work as done, unless the practice of refusing payment and sending claimants here is to be perpetuated, and in view of the manifest advantage of having that rate the same with all the roads, Congress has practically agreed that, irrespective of the particular relations between the cost of a road and the cost of its equipment, 50 per cent. of its gross earnings is a fair compensation to the company for the actual cost of transportation and such part of the profits upon transportation as are earned by the company out of the government. We have, therefore, felt ourselves justified in finding as a fact that 50 per cent. of gross earnings is such a proper compensation.

The case has been appealed to the Supreme Court of the United States, and will, it is presumed, take its regular course upon the calendar; if so, a final decision may not be reached for some time. Meanwhile, many of the railroad companies are doubtless willing to accept 50 per cent. of their charge in settlement of their accounts against the government; but without an appropriation for the purpose, and authority for such settlements and payments to be made, the companies must bring suits in the Court of Claims—an expensive and tedious method, which should be avoided if possible. The question is again referred to in the "Recommendations for legislation" given in the latter part of this report.

THE CONSOLIDATION OF THE UNION, KANSAS, AND DENVER PACIFIC COMPANIES.

Appendix K of this report contains a copy of the articles of consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, entered into January 24, 1880, and filed in the Department of the Interior, in accordance with law, on January 26, 1880, from which date the articles take effect.

The name of the company formed by the consolidation is "The Union Pacific Railway Company."

The consolidation was ratified by vote of the stockholders of the Union Pacific Railroad Company at Omaha, Nebr., August 18, 1880; by vote of the Denver Pacific stockholders at Denver, Colo., September 30, 1880; and by vote of the Kansas Pacific stockholders as shown in Appendix K.

The directors of the consolidated company are Fred L. Ames, Ezra H. Baker, Elisha Atkins, F. Gordon Dexter, Sidney Dillon, Russell Sage, Jay Gould, Solon Humphreys, David Dows, William L. Scott, Silas H. H. Clark, Thomas T. Eckert, John Sharp, Grenville M. Dodge, and Carlos S. Greeley, who hold office until March 9, 1881, when the annual meeting of stockholders will take place in the city of New York.

Capital stock of the consolidated company to the amount of \$46,226,150 had been issued up to the 30th of June, 1880; \$4,505,200 of the Union Pacific Railroad, \$29,550 of the Kansas Pacific Railway, and \$1,400 of the Denver Pacific Railway and Telegraph Companies' stock remaining unexchanged; the total amount of capital stock of the new company being \$50,762,300—the capital stock of the companies consolidating being replaced by an equal amount of par value of stock in the new consolidated company.

The officers of the Union Pacific Railroad Company were retained as officers of the Union Pacific Railway Company.

THE UNION PACIFIC RAILWAY COMPANY.

This Company is the successor, by consolidation January 26, 1880, to the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company.

The property acquired under the consolidation is operated in two divisions, known as "Union Division" and "Kansas Division," which include all controlled branches and extensions. The total number of miles owned, and upon which the capital stock and funded debt are based, are 1,814.848, of which 1,432.6225 miles have been subsidized with bonds, and 1,783.17 miles have been subsidized with lands.

The condition of this property, in which the government has an interest as creditor amounting to more than \$45,000,000, was found in August, 1880, the date of the last inspection, much improved, and great credit is due the manager and his assistants.

The report of the railroad engineer, pages 16 to 45, gives some interesting detail in regard to work done and in progress on both divisions of the main property; also, in regard to the Summit County Branch and the Utah and Northern (narrow gauge) controlled road.

The Union Division main line from Council Bluffs to Ogden is being rapidly brought up to a very high standard of condition; 641 of the 1,035 miles having been laid with steel rails to September 30, 1880, and contracts have been already made for steel rails enough to relay the remaining 394 miles during the coming year.

The railway buildings at Ogden, Utah, have not been improved, although the necessity of an entire remodeling and rebuilding of the passenger and freight depôts at that point is more urgent than ever at this time, owing to the large business centering there.

At Denver, Colo., the company has built and is using a new and substantial stone freight-house, has put up a large and well-arranged coaling station with patent chutes, and has well under way a fine stone round-house. These extensive improvements, with the Grand Union Passenger Depot, in which this company is largely interested, will probably require an expenditure of over half a million dollars.

During the fiscal year new equipment has been purchased to an amount exceeding \$900,000, and over \$150,000 has been expended in new buildings and new construction, which amounts have been charged to construction and equipment accounts.

Aggregating the expenditures of the three old companies for the seven months from July, 1879, to January, 1880, inclusive, and adding thereto the five months' business of the Consolidated Company from February to June, inclusive, 1880, and comparing the results with the aggregate results of the operation of the three companies for the year ending June 30, 1879, it is found that "maintenance of way" for the year ending June 30, 1880, has cost \$2,815,185.30, as against \$2,308,440.95 for 1879, while "general expenses" have decreased \$60,757.81, indicating liberal improvements and economy under the consolidation.

The coal business of the company increased largely in the year 1879, the production at all the mines being 340,000 tons, as against 275,000 in 1878 and 275,000 in 1877. Several new shafts are being sunk, so that the production will be still more largely increased hereafter. The average cost of the coal at the mouth of the mines for the past three years has been \$1.08 per ton of 2,000 pounds. The sales of coal during 1879 were 125,662 tons, at an average price of \$5.65 per ton, being an increase of 23,422 tons sold over the quantity sold in 1878, at an average price of \$5.65 per ton, being a reduction from the average price of 1878 amounting to 48 cents per ton.

In regard to the lands of the consolidated company, the sales during the five months ending June 30, 1880, amounted to \$580,855.99. The amount of principal outstanding June 30, 1880, on account of "time sales" of lands was \$5,535,055.63, and at the same date the quantity of granted lands remaining unsold was nearly 16,000,000 acres. The exact quantity of lands of the three companies sold to the same date cannot be stated, but it approximates 3,300,000 acres, which have been sold for over \$13,000,000.

Among the assets of the company are large amounts of the stock and bonds of the branch lines and extensions. On June 30, 1878, these investments amounted to \$5,229,327.84; on June 30, 1879, they amounted to \$7,534,243.91, and on June 30, 1880, to \$15,338,453.94, which amounts represent their actual cost, as it appears on the books of the company. Since the date last named, the company has added largely to such investments, so that at this time they amount to more than \$20,000,000 of actual cost, and probably \$40,000,000 of face value. The business of these branch lines, in which the company holds so large an interest, is growing both in amount and profit. That of the Utah and Northern, and Denver, South Park and Pacific—both narrow-gauge roads running through mining country—is adding largely to the business of the main line. The accompanying list will give some idea of the kind and value of these properties.

Branch roads controlled by the Union Pacific.

Name of road.	Miles.	Name of road.	Miles.
Omaha and Republican Valley	132	Golden, Boulder and Caribou	6
Omaha, Niobrara and Black Hills	48	Kansas Central	119
Saint Joseph and Western	252	Central Branch Union Pacific and	
Marysville and Blue Valley	38	Leased Lines	363
Colorado Central	178	Julesburg Branch	150
Summit County	30	Saint Joseph Bridge	1
Utah and Northern	382	Utah Central	37
Carbondale	32	Utah Southern and extensions	242
Junction City and Fort Kearney	70	Utah Western	37
Solomon	57	Denver, South Park and Pacific	164
Salina and Southwestern	36	Wahsatch and Jordan Valley	81
Denver and Boulder Valley	27	Manhattan, Alma and Burlingame	58

This makes a total of 2,490 miles of branch and feeding lines, which added to the 1,815 miles of main property, gives 4,305 miles owned and controlled, although not all operated, by the company.

The policy of investing in these branch lines is undoubtedly the best for insuring a continuance of profitable business for the main line, and so long as the government has such a large interest as creditor it cannot but sanction and confirm such investments. If there is any way by which these branch properties could be merged in or consolidated with the main property it would be desirable, so that in any event or contingency the main property could not be deprived of these valuable feeders.

The receipts and expenditures of the company for the year ending June 30, 1880, have been summarized as follows:

RECEIPTS.

Earnings	\$20,517,806 82
Other income	1,890,634 34
Total receipts	22,408,441 16

EXPENDITURES.

Operating expenses and taxes	\$9,322,051 38
Interest on funded debt	3,070,404 75
New construction	145,460 09
New equipment	895,070 42
Other income expenditures	765,739 13

Total expenditures..... 14,198,725 77.

Surplus available for interest due and unpaid, United States sinking-fund act, and other requirements—dividends, &c	\$8,209,715 39
Interest on funded debt due and unpaid (estimated)	\$2,570,915 19
Requirements for the United States debt (estimated) ...	1,750,000 00
Dividends paid, nearly 5 per cent.....	<u>2,489,134 50</u>
	6,810,049 69

Net surplus over all expenditures and requirements..... 1,399,665 70

The statements from which the above summary has been taken are as follows:

Union Pacific Railroad Company (1,039 miles).

(Seven months ending January 31, 1880.)

RECEIPTS.

United States passenger, six months	\$108,163 76
United States freight, six months	254,442 83
United States mail, seven months.....	<u>348,118 75</u>
	\$710,725 34
Commercial passenger.....	1,758,891 60
Commercial freight	*5,534,825 35
Express	<u>182,110 36</u>
	7,475,827 31
Miscellaneous earnings.....	<u>94,008 67</u>

Total earnings	8,290,561 32
Discount and interest received.....	10,213 00
Interest on bonds held	215,940 00
Dividends on stocks held.....	139,216 50
Gains on investments.....	1,043 36
Miscellaneous (lands)	<u>386,598 30</u>

Total income receipts

Total receipts..... 9,033,572 48.

EXPENDITURES.

Conducting transportation	\$620,587 01
Maintenance of way.....	624,054 63
Motive power.....	1,232,376 03
Maintenance of cars.....	256,649 02
General expenses (taxes included)	<u>314,362 45</u>
Total operating expenses.....	\$3,048,029 14
Discount and interest	40,065 92
Interest on funded debt	1,689,531 00
Loss on investments.....	254 73
Dividends paid	1,102,350 00
Sinking-fund requirements (company's)	138,144 00
New construction	25,533 37
New equipment	66,555 26
Land expenses and taxes.....	<u>113,826 43</u>

Total income expenses and dividends

Total expenditures..... 6,224,289 85

Surplus receipts over expenditures, seven months..... 2,809,282 63

*Including \$422,924.06 "company freight."

RAILROAD ACCOUNTS.

27

Kansas Pacific Railway Company (672 miles).

(Seven months ending January 31, 1880.)

RECEIPTS.

United States passengers, six months	\$15,733 10	
United States mail, seven months	50,796 78	
		\$66,529 88
Commercial passengers	674,936 61	
Commercial freight	*2,189,464 47	
		2,864,401 08
Express	85,808 86	
Company freight	111,160 54	
Miscellaneous	18,533 61	
		215,503 01
Total earnings		3,146,433 97
Other income, incidentals		26,552 83
Total receipts		3,172,986 80

EXPENDITURES.

Conducting transportation	\$363,999 52	
Motive power	431,843 14	
Maintenance of cars	101,836 42	
Maintenance of way	705,644 08	
General expenses (including taxes)	238,248 22	
		\$1,841,571 38
Total operating expenses		
Discount and interest	27,175 89	
New construction	2,371 86	
New equipment	168,114 00	
Incidentals	182,587 28	
Total income expenses		380,249 03
Total expenditures		2,221,820 41
Surplus receipts over expenditures, seven months		951,166 39

Denver Pacific Railway and Telegraph Company (106 miles).

(Seven months ending January 31, 1880.)

RECEIPTS.

United States passengers, six months	\$231 00	
United States mail	532 65	
United States freight	1,468 77	
Commercial passengers	36,145 19	
Commercial freight	71,979 40	
Express	2,260 68	
Miscellaneous	2,186 74	
Total earnings		114,504 43

EXPENDITURES.

Conducting transportation	\$28,166 32	
Motive power	25,691 36	
Maintenance of cars	3,433 21	
Maintenance of way	44,614 51	
General expenses and taxes	18,045 31	
Total operating expenses		119,950 71
Deficit, seven months		5,146 28

* Including government freight.

Union Pacific Railway Company (1,815 miles).

(Five months ending June 30, 1880.)

RECEIPTS.

United States passengers	\$104,158 00	
United States freight.....	174,098 52	
United States mail	304,883 61	
		\$583,140 13
Commercial passengers.....	2,475,030 57	
Commercial freight.....	*5,470,835 21	
Express.....	292,122 11	
		8,237,987 89
Miscellaneous		154,879 08
		8,976,007 10
Total earnings		
Discount and interest received.....	13,744 06	
Interest on bonds held.....	286,620 01	
Dividends on stocks held	68,590 00	
Gains on investments.....	30,666 67	
Miscellaneous, lands, &c.....	711,449 61	
Total income receipts.....		1,111,070 35
Total receipts		10,087,077 45

EXPENDITURES.

Conducting transportation.....	\$805,345 85	
Maintenance of way.....	1,440,872 08	
Motive power	1,405,598 62	
Maintenance of cars.....	312,692 68	
General expenses and taxes.....	347,990 92	
Total operating expenses.....		\$4,312,500 51
Discount and interest	50,154 62	
Interest on funded debt	1,380,873 75	
Sinking fund requirement (company's)	73,700 00	
New construction.....	117,554 86	
New equipment	660,401 16	
Dividends	1,386,784 50	
Land expenses	139,830 26	
Total income expenses.....		3,809,299 15
Total expenditures		8,121,799 30
Surplus, five months		1,965,278 15

The following statement shows the financial condition of the company on June 30, 1880. It will be seen that there is quite a large surplus to the credit of income account, notwithstanding the fact that the investments of the company are counted at cost.

The statement immediately succeeding shows the condition of the Union Pacific Railroad Company January 31, 1880; that is, prior to consolidation. The consolidation took effect January 26, 1880, but the accounts of earnings, expenses, &c., of the new company were not opened until of date February 1, 1880, for the sake of convenience and simplification of much of the detail in the auditor's and other offices.

* Including \$526,517.45 "company's freight."

Union Pacific Railway Company.

(At close of five months ending June 30, 1880.)

LIABILITIES.

United States subsidy bonds.....	\$33,539,512 00
Interest on United States bonds.....	25,050,071 34
Other bonded debt.....	82,434,357 62
Interest due and accrued.....	1,163,402 88
Pay rolls and vouchers.....	1,691,486 34
Bills payable.....	2,894,368 60
Accounts payable.....	1,732,600 72
Dividends payable.....	699,630 00
Capital stock.....	50,762,300 00
	<hr/>
	196,967,729 50
Balance, surplus or credit to income account, including land sales, &c.....	1,974,739 39
	<hr/>
	201,942,468 89

ASSETS.

Road and equipment.....	\$154,485,642 29
Real estate other than road.....	77,949 60
Fuel, material, &c., on hand.....	1,850,669 82
Cash.....	2,047,329 79
Company's bonds and stocks.....	1,320,685 60
Other bonds and stocks and investments.....	15,338,453 94
Bills receivable.....	78,194 74
Accounts receivable.....	7,121,617 87
Due from the United States.....	5,818,752 21
Interest repaid to the United States.....	6,802,008 31
United States sinking fund.....	538,327 51
Sinking fund with trustees.....	613 12
	<hr/>
	195,480,244 80
Land contracts, land—cash, &c.....	6,462,224 09
	<hr/>
	201,942,468 89

Union Pacific Railroad Company.

(January 31, 1880.)

LIABILITIES.

United States bonds.....	\$27,236,512 00
Interest on United States bonds.....	19,238,182 89
Other bonded debt.....	51,753,000 00
Interest due and accrued.....	129,956 06
Pay-rolls and vouchers.....	166,202 37
Bills payable.....	3,380,741 54
Accounts payable.....	385,075 47
Dividends payable.....	10,879 00
Capital stock.....	36,762,300 00
	<hr/>
	139,062,849 33
Land sales.....	8,786,399 23
Surplus, or credit to income account.....	1,454,876 48
	<hr/>
	149,304,125 04

ASSETS.	
Road and equipment.....	\$120,753,718 02
Cash.....	110,015 31
Company's bonds and stocks.....	202,195 53
Other bonds and stocks.....	7,705,490 73
Bills receivable.....	40,000 00
Accounts receivable.....	3,494,522 57
United States transportation withheld.....	9,279,409 66
Operating department.....	1,591,136 94
	<hr/>
	143,176,488 76
Land—cash, and land notes.....	4,193,821 54
Land expenses.....	1,933,814 74
	<hr/>
	149,304,125 04

For the year ending December 31, 1879, and as ascertained in accordance with the act of Congress approved May 7, 1878, the "net earnings" of the Union Pacific Railroad Company were \$6,131,664.48, of which sum \$1,532,916.12—being twenty-five (25) per cent. thereof—is payable to the United States on account of the bond and interest indebtedness.

The following is a detailed statement of the earnings and expenses for the year, which has been verified by examination of the books of the company. The amount claimed for mail service is subject to such correction as may be found necessary upon decision of the Supreme Court yet to be had.

Statement of Earnings and Expenses of the Union Pacific Railroad Company, 1879.

(As ascertained in accordance with the act of Congress of May 7, 1878.)

EARNINGS.	
United States: passenger.....	\$150,965 23
freight.....	401,947 78
mail.....	596,775 00
	<hr/>
	\$1,149,688 01
Commercial: passenger.....	3,056,944 69
freight.....	7,424,516 52
express.....	360,840 90
	<hr/>
	10,842,302 11
Company freight.....	865,949 94
Car service.....	11,188 13
Rent of buildings.....	44,624 60
Miscellaneous.....	314,998 26
	<hr/>
	1,236,760 93
Total earnings.....	<hr/>
	13,228,751 05
EXPENSES.	
Conducting transportation.....	1,004,507 89
Motive power.....	2,004,334 16
Maintenance of cars.....	447,012 81
Maintenance of way.....	1,397,696 78
General expenses.....	595,807 55
	<hr/>
	5,449,359 19
Car service.....	11,167 39
Interest paid on bonds—first mortgage.....	1,636,530 00
Premium on gold.....	29 99
	<hr/>
	1,647,727 38
Total expenses under law of May 7, 1878.....	<hr/>
	7,097,086 57
Net earnings so ascertained.....	<hr/>
	6,131,664 48
Twenty-five per cent of net earnings ascertained.....	<hr/>
	1,532,916 12
Deduct United States transportation, as above, 1879.....	<hr/>
	1,149,688 01
Remainder—cash or additional payment required under the law.....	<hr/>
	383,228 11

The disposal of the amount, \$1,532,916.12, being 25 per cent of the net earnings so found, is considered by this office to be as follows, viz:

One-half transportation service	\$574,844 01
Cash payment—five per cent of net earnings	306,583 22
For credit on bond and interest account	881,427 23
One-half transportation service	574,844 00
Cash payment, being that portion of the \$850,900 named in section 4 of the act, which is required for the year 1879	76,644 89
Payable into the sinking fund established in the Treasury of the United States	651,488 89

This view of the question of disposal coincides with that adopted by the Judiciary Committee of the Senate, when the bill which subsequently became law was reported back—Senate Report No. 111, Forty-fifth Congress, second session, page 5. The “five per cent. of net earnings” are still payable under section 6 of the act of Congress approved July 1, 1862 (12 Statutes, 489), the act of May 7, 1878, merely defining, in section 1, how the net earnings were to be ascertained after June 30, 1878. The company's officers have taken the view that, as the Supreme Court of the United States decided in the “five per cent.” cases that expenditures for new equipment and new construction were to be considered “operating expenses,” such items of expenditure are deductible from earnings under the definition given in the first section of the sinking-fund law. If the decision of the Supreme Court is to govern, then the item of interest on first-mortgage bonds cannot be deducted as an expense, as now considered according to the plain instructions of the act. Additional new equipment and new construction can in no sense be considered either as “necessary expenses actually paid within the year in operating” the road, or for “keeping the same in a state of repair.” Then again, the items expended for such equipment and construction will probably in no year amount to anything approaching the sum paid as interest on first-mortgage bonds; so that taking the principle laid down in the “five per cent.” decisions in one case and the principles laid down in the act of 1878 in another, the sinking-fund act basis of net earnings is much more favorable to the railroad companies than that of the Supreme Court.

In table No. 11, attached to this report, will be found comparative statements of the earnings and expenses of the company (consolidated), and of the previous companies, covering a period from January 1, 1878, to June 30, 1880.

CENTRAL PACIFIC RAILROAD COMPANY.

The Central Pacific Railroad Company was operating on June 30, 1880, 2,487.20 miles of railroad, as against 2,323.61 on June 30, 1879. Of this mileage the company owns 1,204.50, and operates, under lease, 1,282.70. Of the 1,204.50 miles, 860.66 have been subsidized by the United States with bonds, and 1,012.47 with lands.

The report of the railroad engineer in regard to the condition of this property, including a portion of the leased lines, is referred to for details of information and inspection.

During the fiscal year the company has opened the new and shorter route from Sacramento to San Francisco, via Benicia and Port Costa, using a mammoth transfer ferry-steamer to carry trains across the straits of Carquinez.

This route is over roads *not subsidized* by the United States. The eastern overland mail is carried on this route, and the bulk of the over-

land freight and passenger traffic is done upon it, in preference to the much longer subsidized line. A question suggests itself in this connection, however, as to whether three or four hours quicker transit is more to be considered by the Railway Mail Service than the retention of a larger or smaller proportion of the compensation for carrying the mail. More important even than that is the fact that the use of the new route reduces the amount of through and local business on the subsidized line extending from Sacramento to Niles, via Tracy, on the net earnings of which the government is entitled to twenty-five per cent., under the requirements of the sinking-fund law. And in the same direction, but of vaster proportions, is the still greater fact that when the junction of this company's leased lines from Goshen, south and east, is effected with those of the Atchison, Topeka and Santa Fé Company, in New Mexico; of every dollar of overland business diverted and done on that route at least fifty cents will be lost from payments on the debt of the Pacific Railroad Companies to the government.

While the property of the Central Pacific Railroad Company as a whole is in good condition and well maintained, there are some things mentioned by the engineer which seem to require notice. A good many small girder bridges have masonry in poor condition, and should be rebuilt. Temporary trestle approaches to bridges in the Sierras should be done away with. The supply of steel rails for renewals on the main line has not kept up with deterioration of the old iron, so that there are a few badly worn places. The engineer considers it important, and with good reason, that switches in the snow galleries and on all that portion of the road, even between Rocklin and Truckee, about 100 miles in length, should be lighted for night trains. It is recommended that the section for girders for small spans should be increased as renewals are made, and that truss bridges as rebuilt should be designed for heavier loads. The floor system for bridges on this road is faulty; ties are too far apart; are liable to be bunched; are short, and generally without guard-rails to prevent a derailed truck from leaving the bridge.

Among the more noteworthy improvements on the subsidized portion of the road may be mentioned the new car shops and other buildings at Ogden, Utah, and the extensive yard facilities furnished at that point; the spacious and convenient new passenger depot at Sacramento, and also the new freight depot at the same place, and the very extensive renewals of snow-gallery necessitated by the destructive avalanches of last winter.

On the unsubsidized portion of the company's property and railroad, the extensive improvement in progress at Oakland wharf is worthy of notice. A solid and safe embankment, of stone and gravel brought from the Alameda Cañon, beyond Niles, some seventy-five or more feet wide, and over a mile long, increasing in width at the terminal point in the bay to 280 feet, with a length of 1,250 feet—being an area of about eight acres—it will afford the company permanent and probably ample room for the largely increasing business at that point, and result in great economy, as compared with the present piling and wharf arrangements.

Of the road (1,204½ miles), 462 miles had steel track on June 30, 1880.

SOUTHERN PACIFIC OPERATED BY CENTRAL PACIFIC.

That portion of the Southern Pacific which is leased and operated by the Central Pacific Railroad Company extends from Huron to the Colorado River opposite Yuma, 550.20 miles, of which 340 miles were steel track on December 31, 1879.

There are nearly three miles of tunnels on this road in the Tehachapi and San Fernando Mountains. The water supply between Walters and

the Colorado River is very deficient—water trains having to be run continually more than 100 miles through this desert, much of which is below the ocean level.

The western end of the Southern Pacific of Arizona is also quite deficient in supply of good water, the greater portion of the country through which it runs being probably as desert land as can be found anywhere, which, added to the great heat of summer in that region, makes railroad work costly and difficult.

The system of short vandyke ditches and culverts adopted by the company to protect its track from washouts caused by cloudbursts in the region of country east of Seven Palms, in Southern California, has proved very successful, but no protection has yet been found against the terrible sand storms to which the desert is subject or against the drift of sand which often blockades the track and interferes with railroad operations. Until an eastern connection is made, the main traffic will be, as it has been in the past, that dependent upon supplies of machinery and merchandise for the numerous and thriving mining communities of Southern Arizona. When an eastern connection is effected, no doubt much of the business from and to the east which now passes over the Union, Central, and Southern Pacific Roads will be done by the Atchison, Topeka and Santa Fé, which will have the bulk of the mileage, while the Arizona Road will have but a small portion over its 200 or 250 miles. This being so, the earnings of the leased lines south of Goshen, Cal., as well as those of the main line of the Central and Union Pacific, may be expected, with some reason, to decrease, unless new business, arising from other sources and from the natural development of the country through which they pass, make up the loss. There can be little question as to this result, the distance from Saint Louis to Tucson, via New Mexico, being but 1,676 miles, while by the present roundabout line it is 3,128 miles; and the distance from Chicago to Tucson by the former route will be but 1,882 miles as against 3,218 miles by the present overland lines.

The receipts and expenditures of the Central Pacific Railroad Company for the year ending June 30, 1880, have been as follows:

RECEIPTS.

Earnings	\$17,802,448 16
Other income	929,126 08
Total receipts.....	18,731,574 24

EXPENDITURES.

Operating expenses and taxes	\$8,608,962 92
Rental leased lines	3,009,867 63
Interest funded debt paid.....	3,472,740 00
Discount and interest.....	309,086 96
New construction	237,399 87
New equipment	30,617 92
Other income expenditures	1,058,358 12

Total expenditures	16,727,032 42
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Surplus available for interest due and unpaid, United States sinking-fund act and other requirements, dividends, &c	2,004,541 82
Interest on funded debt due and unpaid (estimated).....	\$1,000,000
Requirement for the United States debt (estimated)	1,000,000
Dividends paid, three per cent	1,628,265
	3,628,265 00
Deficit for the year.....	1,623,793 18

The details are given in the following statements:

Central Pacific Railroad Company.

(Year ending June 30, 1880. Miles operated, 2,389.93.)

EARNINGS AND OTHER RECEIPTS.

Passenger, through, including United States.....	\$1, 613, 106 80
Passenger, way, including United States.....	3, 622, 466 82
Freight, through, including United States.....	2, 332, 655 02
Freight, way, including United States.....	8, 568, 276 45
Mail, United States.....	488, 610 32
Express under Wells, Fargo & Co. contract.....	210, 540 98
Sleeping-car service.....	179, 477 22
Coal transportation.....	268, 154 40
Rents.....	64, 681 55
Miscellaneous sources.....	454, 478 00
Gross earnings.....	17, 802, 448 16
Profits on investments.....	458, 741 61
Land receipts.....	422, 664 01
Steamer division.....	47, 720 46
Total receipts.....	18, 731, 574 24

EXPENDITURES.

Conducting transportation.....	2, 102, 035 56
Maintenance of way.....	1, 995, 770 22
Motive power.....	2, 320, 084 87
Maintenance of cars.....	673, 449 82
General expenses and taxes.....	1, 517, 622 45
Total operating expenses.....	8, 608, 962 92
Rental leased lines.....	\$3, 009, 867 63
Discount and interest.....	309, 085 96
Interest on first-mortgage bonds.....	\$1, 718, 280 00
Interest on other debt.....	1, 754, 460 00
Losses operating river steamers.....	22, 511 81
Expenses land department.....	69, 533 29
New construction.....	237, 399 87
New equipment.....	30, 617 92
Land bonds redeemed.....	647, 365 05
Surveys.....	14, 351 15
Requirements company's sinking funds.....	304, 596 82
Dividends, 3 per cent.....	1, 628, 265 00
Total income expenses.....	\$9, 746, 334 50
Total expenditures.....	18, 355, 297 42

The following statement shows the financial condition of the Central Pacific Railroad Company on June 30, 1880:

LIABILITIES.

United States subsidy bonds.....	\$27, 855, 680 00
Interest on subsidy bonds.....	20, 106, 781 81
Other bonded debt.....	56, 830, 000 00
Interest due and accrued.....	1, 484, 345 00
Bills payable.....	790, 807 19
Accounts payable.....	4, 926, 200 76
Dividends.....	2, 811 00
Capital stock.....	*59, 275, 500 00
	171, 272, 125 76
Trustees land-grant mortgage.....	224, 164 59
Total.....	171, 486, 290 35

*Capital stock issued during the year, \$5,000,000, has increased the balance outstanding from \$54,275,500 to this sum.

ASSETS.

Road and fixtures.....	\$136,558,752 45
Equipment	8,045,262 10
Real estate.....	2,560,396 81
Cash.....	1,855,357 31
Material, &c.....	1,932,696 76
Company's bonds and stocks.....	7,259 29
Other bonds and stocks and investments.....	2,326,763 11
Bills receivable.....	1,877,773 56
Sinking-fund with trustees.....	4,187,176 65
Accounts receivable.....	786,795 65
United States transportation account }	
United States sinking-fund account.. }	4,929,239 82
	<hr/>
	165,067,473 51
Balance, deficit.....	6,428,816 84
	<hr/>
	171,496,290 35

For the year ending December 31, 1879, and as ascertained in accordance with the requirements of the act of Congress approved May 7, 1878, known as the sinking-fund law, the net earnings of the Central Pacific Railroad Company were \$3,598,255.68, of which sum \$899,563.92 (being 25 per cent. thereof) is payable to the United States on account of the bond and interest and sinking-fund accounts. The following is a detailed statement of the earnings and expenses for the year named, which have been verified by examination of the books of the company in San Francisco and New York. The company having operated many miles of unsubsidized road—some of it owned and some leased—and on which no separate accounts for certain expenditures had been or could be kept without great difficulty, a *pro rata* on various bases has been adopted for their distribution; otherwise, the amounts are actual.

Statement of earnings and expenses of the Central Pacific Railroad Company, 1879.

[Ascertained in accordance with the act of Congress of May 7, 1878.]

Earnings.	Through.	Local.	Leased lines.	Total.
Subsidized line proportion:				
90.06328 per cent. of through;				
66.1692 per cent. of local.....	\$4,417,561 87	\$5,640,770 48	.....	\$10,058,332 35
Unsubsidized line proportion:				
9.93462 per cent. of through;				
33.5308 per cent. of local.....	487,277 12	2,883,997 06	.....	3,371,274 18
Amount found by auditor of company				
on a <i>pro rata</i> of mileage.....			\$3,237,875 38	.....
Add 15 per cent. leased lines being en-				
titled to for business.....			485,681 30	3,723,556 63
Totals.....	4,904,838 99	8,524,767 54	3,723,556 63	\$17,153,163 16
Average miles operated during the				
year.....	894.75	1300.694	1018.226	2318.92
Average miles of subsidized road				
operated during year.....	805.86	860.66	.....	860.66
Percentage subsidized road to whole..	90.06538	66.1692	.....	37.114 68
Percentage of gross earnings after				
Stockton and Copperopolis (\$101,-				
533.92) deducted.....	28.7646	49.9940	21.2414	100

EXPENSES.

Items and amounts as hereafter distributed :

Operating ledger accounts.....	\$10,207,862 89
General ledger accounts:	
General expenses.....	394,752 79
Legal expenses.....	190,136 38
Engineering.....	20,886 02
Taxes.....	312,609 22
Interest on first-mortgage bonds.....	1,671,540 00
Total.....	<u>12,797,787 30</u>

Distribution of expenses (\$12,797,787.30).

Deductions:

"General expenses"—items questioned, or not located on subsidized property.....	\$226,337 38
"Legal expenses"—items questioned, or not located on subsidized property.....	38,156 03
"Engineering"—items questioned, or not located on subsidized property.....	310 00
"Taxes," lands.....	32,544 39

Located:

Stockton and Copperopolis, leased and unsubsidized.....	56,417 63
Rentals of leased lines, subsidized.....	\$43,629 05
Rentals of leased lines, other.....	2,646,694 10
Snow service, subsidized line.....	2,690,323 15
Snow-sheds, subsidized line.....	49,049 82
Track repairs, subsidized line.....	19,710 82
Track repairs, unsubsidized line.....	821,084 25
Bridges and buildings, unsubsidized line.....	719,710 03
Bridges and buildings, subsidized line.....	88,949 88
Taxes, subsidized line.....	145,136 60
Taxes, unsubsidized line.....	1,540,794 28
Interest on first-mortgage bonds, subsidized line.....	234,086 48
Taxes, unsubsidized line.....	192,672 22
Taxes, unsubsidized line.....	83,142 18
Interest on first-mortgage bonds, subsidized line.....	275,814 40
Interest on first-mortgage bonds, subsidized line.....	1,671,540 00

Not located (distributed on proportion of gross earnings, see statement, ante):

Through, \$1,715,147.64 (28.7646 per cent.); local, \$2,980,993.69 (49.9940 per cent.); leased lines, \$1,266,561.59 (21.2414 per cent.).....	5,962,702 92
Total.....	<u>12,797,787 30</u>

On mileage basis:

Subdistribution of "not located," as above:

Subsidized: Through, \$1,544,754.24 (90.06538 per cent.); local, \$1,972,499.67 (66.1692 per cent.); total.....	3,517,253 91
Unsubsidized: Through, \$170,393.40 (9.93462 per cent.); local, \$1,008,494.02 (33.8308 per cent.); total.....	1,178,887 42
Leased.....	1,266,561 59

Expenses not located, total..... 5,962,702 92*Statement showing "net earnings" of subsidized railroad from data adduced.*

EARNINGS.

Through.....	\$4,417,561 87
Local.....	5,640,770 48
Total.....	<u>\$10,058,332 35</u>

EXPENSES.

Located:	
Rental of 5 miles of Union Pacific.....	\$43,629 05
Snow service.....	49,049 82
Snow-sheds.....	19,710 82
Track repairs.....	821,084 25
Repairs, bridges and buildings.....	145,136 60
Taxes.....	192,672 22
Interest on first-mortgage bonds.....	1,671,540 00
Not located:	
As per "subdistribution," see previous statement.....	3,517,253 91
Total.....	6,460,076 67
Net earnings, "act of May 7, 1878".....	3,598,255 68
"Twenty-five per cent. of net earnings".....	899,563 92
Less; mail service, as per company's books.....	\$417,347 23
Other service, as per company's books.....	253,140 37
Total service.....	670,487 60
Difference, being amount payable in money.....	229,076 32

The disposal of the amount of the "twenty-five per cent. of net earnings," \$899,563.92, is as follows:

One-half transportation service on subsidized line.....	\$226,378 36
Five per cent. of net earnings.....	179,912 78
Total for credit of bond and interest account.....	406,291 14
One-half transportation service on subsidized lines.....	226,378 36
Additional payment required to make the whole of these items amount to "25 per cent. of net earnings".....	266,894 42
Total for sinking fund account.....	493,272 78

During the year the company rendered service to the government on unsubsidized roads to the amount of \$217,730.88, which, deducted from the amount of the two items "five per cent.," \$179,912.78, and "additional payment required," &c., \$266,894.42, which is \$446,807.20, leaves \$229,076.32 payable by the company in money. This amount has been deposited in the Treasury, \$100,000 on August 23, and \$129,076.32 later on, the payment being made by the company under protest, and reserving all the rights of the company, either in law or in equity. In the letters to this office from the Vice-president of the company, giving notice of the payments, the unprofitable nature of the investments for the sinking fund, and the slow process of settling the accounts for transportation, and passing the amounts found due therefor to the credit of the company, are forcibly and with good reason called in question. The remedy is simple, but it lies with the law-making power. On June 30 and October 31, 1880, the market price of the various securities referred to was as follows:

Character of bond.	June 30, 1880.	October 31, 1880.
United States funded loan of 1881, 5 per cent., registered.....	103½	102
United States funded loan of 1907, 4 per cent., registered.....	108½	109½
United States currency sixes (average maturity), 1897, 6 per cent., registered.....	123	126
Union Pacific first mortgage, 6 per cent.....	115½	114
Central Pacific first mortgage, 6 per cent.....	114½	113

Although the currency sixes were quoted as above stated, yet, between those dates, when the investment was made by the Secretary of the

Treasury, it is presumed that none could be obtained lower than the price paid, namely, 129½, and if this be so, any future investment in them will cost still more, say 135 or 140, as the whim or option of holders may choose to demand.

While the lands granted to this company are not as valuable as is generally supposed, large quantities being of a character utterly useless for either agricultural or grazing purposes, some 750,000 acres have sold at an average price of, say, \$6 per acre, but these are perhaps the very best lands in the entire grant. The number of acres remaining unsold is nearly 11,000,000, worth at a fair estimate not over \$1.25 per acre as an average, millions of acres having no value whatever. Table No. 10 gives detailed information in regard to the land-grants of this company.

Table No. 11 gives comparative statements of the earnings and expenses of the railroad operated by this company for various periods as therein designated.

CENTRAL BRANCH UNION PACIFIC RAILROAD COMPANY.

Since my last annual report, important changes have occurred in the ownership and management of this property. Some time in December, 1879, a controlling interest in this road was purchased by the owners of the Kansas Pacific, in order to avoid the complications and waste of capital likely to result from the building of parallel lines in Central Kansas and westward, where the branch lines and extensions of both companies were being pushed. Since the consolidation of the Union and Kansas Pacific Companies, the interest in this property is owned by the Union Pacific Railway Company, the president of which company is also president of the Central Branch.

The road and the leased lines controlled by it (363.34 miles on June 30, 1880) are operated by the Missouri Pacific Railway Company, with whose road it connects at Atchison.

The subsidized property was inspected in September, 1880, and the report of the engineer gives details of condition. Generally the road, track, and buildings have been kept up and improved, while large additions have been made to the equipment.

The business of the road for the past year has largely increased over that of previous years, and if crops are good during the coming year, still better results may be expected. The country through which the road runs is filling up with an intelligent farming population, so that its future prosperity is placed beyond question.

The tables attached to this report furnish information in detail in regard to lands, comparative earnings, and other matters.

The receipts and expenditures of this road for the year ending June 30, 1880, have been as follows:

Central Branch Union Pacific Railroad Company, for the year ending June 30, 1880 (miles operated, 300).

RECEIPTS.	
Commercial passenger.....	\$208,866 26
Commercial freight.....	754,757 75
United States mail.....	16,567 01
Express.....	9,330 00
Miscellaneous.....	\$989,521 02
	28,363 37
Total earnings.....	1,017,884 39
Land receipts (6 months, 1880).....	102,530 70
Total receipts.....	1,120,415 09

EXPENDITURES.

Conducting transportation.....	\$148,305 52	
Maintenance of way.....	347,919 57	
Motive power.....	156,510 68	
Maintenance of cars.....	35,572 01	
General expenses, including taxes.....	56,076 44	
Total operating expenses.....		\$744,384 22

INCOME EXPENSES.

Rental leased roads.....	\$196,924 15	
Interest, first-mortgage bonds.....	96,000 00	
Interest on other funded debt.....	22,050 00	
New construction and equipment.....	189,703 64	
Expenses land department.....	10,193 75	
Total income expenses.....		514,871 54
Total expenditures.....		1,259,255 76
Deficit.....		138,840 67

The liabilities and assets of the company, so far as can be ascertained, are as follows:

Central Branch Union Pacific Railroad Company, June 30, 1880.

LIABILITIES.

United States subsidy bonds.....	\$1,600,000 00	
Interest on United States bonds.....	1,261,808 26	
Other bonded debt.....	2,225,218 14	
Interest on bonded debt.....	5,221 87	
Pay-rolls and vouchers.....	5,911 36	
Bills payable for equipment \$139,871.95 }		
Bill payable for land department. 104,570.19 }	244,442 14	
Accounts payable.....	313,365 59	
Capital stock.....	1,000,000 00	
		6,655,967 36

ASSETS.

Road and fixtures.....	\$3,962,974 75	
Cash.....	11,587 50	
Company's bonds and stocks.....	15,400 00	
Other bonds and stocks and investments.....	120,245 89	
Bills receivable (land contracts).....	430,978 47	
Accounts receivable.....	42,281 97	
Due from United States.....	18,573 65	
Interest repaid to United States.....	54,548 60	
		4,656,590 83
Deficit, or debit to income.....		1,999,376 53
		6,655,967 36

THE SIOUX CITY AND PACIFIC RAILROAD COMPANY.

This company owns 107.42 miles of railroad, and operated under lease the branch lines extending from Fremont, Nebr., westward, known as the Fremont, Elkhorn and Missouri Valley Railroad and Extensions, 109.99 miles, on June 30, 1880.

The inspection of this property was made in August, 1880, but did not include the road west of California Junction.

With all the difficulties connected with the operation of this railroad, the precarious crossing of the Missouri River, at Blair, and the refusal of the Union Pacific to give equal facilities and rates for business, great improvement, both in the property itself and in the business, is noted.

In addition to keeping the property in ordinarily good repair, the company has expended large sums in rebuilding bridges, all of which are now in first-class order.

The earnings on the subsidized portion of this road for the current year, 1880, are much larger than ever before, as will be seen by reference to Table No. 11.

The receipts and expenditures of the company for the year ending June 30, 1880, from business on lines owned and leased, have been as follows:

Stout City and Pacific Railroad Company for year ending June 30, 1880. (Miles operated, 217.41.)

RECEIPTS.	
United States passenger	\$4,277 30
United States freight	2,076 71
United States mail	15,458 81
	<u>\$21,812 82</u>
Commercial passenger	125,915 87
Commercial freight	390,437 03
Express	4,581 31
	<u>520,934 21</u>
Miscellaneous	6,901 01
	<u>549,648 01</u>
Total earnings	549,648 01
Interest (on investments)	279 61
Gains on investments	3,714 67
Receipts on account of business furnished other lines from leased lines of company	14,772 61
Receipts land department	181 05
	<u>18,947 94</u>
Income receipts	18,947 94
Total receipts	<u><u>568,595 98</u></u>
EXPENDITURES.	
Conducting transportation	71,834 87
Maintenance of way	127,876 89
Motive power	87,084 13
Maintenance of cars	18,749 81
General expenses and taxes	40,377 33
Maintenance of ferry	46,361 53
	<u>392,284 56</u>
Total operating expenses	392,284 56
Rental of leased lines	28,947 47
Discount and interest	439 90
Interest on bonds	97,680 00
Dividends	11,830 00
Expenses of land department	25
	<u>138,897 62</u>
Total income expenses	138,897 62
Total expenditures	<u><u>531,182 18</u></u>
Surplus	<u><u>37,413 80</u></u>

The financial condition of the company on June 30, 1880, was as follows:

LIABILITIES.	
United States subsidy bonds	\$1,628,320 00
Interest on United States bonds	1,171,199 89

First-mortgage bonds	\$1,628,000 00	
Interest on bonds	51,165 00	
Pay-rolls and vouchers	74,140 22	
Bills payable	19,130 00	
Accounts payable	\$53,673 99	
Company's accounts, traffic	101,470 06	
Company's accounts, leases	30,177 78	
	<hr/>	185,321 83
Capital stock		2,068,400 00
		<hr/>
		6,825,676 94
		<hr/>
ASSETS.		
Road and fixtures		5,355,551 28
Fuel, material, &c		51,012 04
Cash		44,638 52
Company's bonds		5,000 00
Miscellaneous investments		14,130 00
Accounts receivable	\$57,645 62	
Accounts—traffic	96,457 40	
	<hr/>	154,103 02
Due from the United States		120,021 98
		<hr/>
		5,744,456 84
Deficit or debit to income		1,081,220 10
		<hr/>
		6,825,676 94
		<hr/>

THE DEFICITS OF THE PACIFIC RAILROAD COMPANIES.

From the statements given, showing the financial condition of the subsidized companies, it appears that the following deficits in "income or profit and loss accounts," existed on June 30, 1880 :

Central Pacific	\$6,428,816 84
Central Branch Union Pacific	1,999,376 53
Sioux City and Pacific	1,081,220 10

From the statement given of the Union Pacific Railway Company, there was *no deficit*, but a surplus on June 30, 1880, amounting to \$1,974,739.39; so that the company, at that time, was virtually in condition to pay its entire debt to the Government as well as an additional four per cent. dividend on its capital stock.

It will be noticed that these statements of the "liabilities" of the companies contain an item "Interest on United States bonds," as well as the principal of the "United States subsidy bonds." This item of interest, stated as a "liability", is not due until the maturity of the bonds—ranging from 1895 to 1899, and the surplus and deficits named are based upon the statement of this interest as owing by the companies; the amounts for each company to June 30, 1880, are as follows:

Union Pacific	\$25,050,071 34
Central Pacific	20,106,781 81
Central Branch Union Pacific	1,261,808 26
Sioux City and Pacific	1,171,199 89
	<hr/>
Total	47,589,861 30

In addition to this large amount of interest already paid by the United States, less the amount retained and applied to its repayment, the government will pay, and the several companies are responsible for, the annual interest for the remaining term of the loan, say seventeen years, at \$3,877,410.72 per year, amounting to nearly \$66,000,000.

THE NEW OVERLAND ROUTE VIA NEW MEXICO AND ITS PROBABLE EFFECT.

The Atchison, Topeka and Santa Fé Railroad Company advertise the opening of this new overland route to the Pacific as likely to occur on or about January 1, 1881.

The Rio Mimbres has been reached by the Southern Pacific graders and the road will soon be open for operation to that point—1,198 miles from San Francisco. The Atchison, Topeka and Santa Fé track has been laid to a point 125 miles south of Albuquerque on the Rio Grande. The gap on November 1, 1880, is probably not more than 100 miles, which will be laid by the two companies and brought into operation by the time advertised. The opening of this new route is pregnant with important questions, all of which cannot now be discussed.

If distance, cost of operation, and profits controlled rates in the strife for business, the old route would have nothing to fear from such legitimate competition.

The distances by the old and new routes are about as follows:

Termini.	Old route.	New route.	Advantage of old over new route.
	Miles.	Miles.	Miles.
Chicago to San Francisco.....	2,409	2,841	432
Saint Louis to San Francisco.....	2,329	2,635	306
Kansas City to San Francisco.....	2,118	2,352	234

Distance in these cases necessarily adds to cost and reduces profits, but aside from that, the operating expenses of the main line of the old route are much lower in proportion to earnings, and probably lower in actual cost per passenger and per ton per mile, than they can ever be on the line from Pueblo to Goshen—nearly 1,500 miles of country, with little local business, and a scarcity of both water and fuel—true, without obstruction from snow, but often obstructed in other ways.

The following tables show the volume, amount, and course of the "through" business of the Union and Central Pacific Railroads for eight years, from 1872 to 1879, inclusive:

Through business of the Union Pacific Railroad.

Calendar years.	Through passengers.			Through freight.			Total earnings.
	Number carried.	Number carried one mile.	Earnings.	Number of tons carried.	Number of tons carried one mile.	Earnings.	
1872.....	59,636	61,548,352	\$7,572,721 11	80,863	83,693,025	\$1,941,678 17	\$4,514,399 28
1873.....	75,960	77,178,471	\$8,134,445 92	94,001	97,291,347	\$2,208,513 57	\$5,242,959 49
1874.....	78,379	80,887,128	\$8,284,017 39	135,121	139,850,277	\$2,111,739 18	\$5,395,756 57
1875.....	103,362	106,696,584	\$8,310,970 81	167,511	168,023,723	\$2,842,914 95	\$6,153,885 76
1876.....	99,422	102,455,041	\$8,539,224 40	171,586	177,591,469	\$2,948,018 38	\$6,487,242 78
1877.....	79,323	82,911,198	\$2,631,519 19	150,441	155,706,635	\$2,530,416 55	\$5,162,235 74
1878.....	66,472	69,123,946	\$2,229,333 59	160,728	166,353,538	\$2,724,684 42	\$4,953,968 01
1879.....	64,440	66,695,400	\$2,100,325 38	180,215	186,522,525	\$2,621,872 56	\$4,731,197 94
Eight years.....	626,994	647,696,120	\$22,811,857 79	1,130,466	1,170,032,539	\$19,929,817 78	\$42,741,675 57
Average yearly.....	78,378	80,958,640	\$2,851,482 22	141,308	146,254,067	\$2,491,237 22	\$5,242,709 45

Through business of the Central Pacific Railroad.

Calendar years.	Through passengers.			Through freight.			Total earnings.
	Number carried.	Number carried one mile.	Earnings.	Number of tons carried.	Number of tons carried one mile.	Earnings.	
1872.....	55,685	49,279,855	\$1,775,656 16	98,656	85,601,483	\$2,228,591 50	\$4,004,247 66
1873.....	67,598	59,678,438	2,182,474 61	110,188	95,660,334	2,472,898 71	4,655,373 32
1874.....	80,291	70,896,963	2,367,966 53	152,443	132,415,564	2,435,710 91	4,823,697 44
1875.....	105,841	93,016,103	2,911,967 43	173,794	153,460,102	3,158,806 96	6,070,763 39
1876.....	96,420	88,004,860	2,761,719 06	188,774	166,687,442	3,423,872 04	6,185,591 10
1877.....	78,682	68,376,206	2,185,169 44	173,239	152,970,037	3,113,935 55	5,299,104 99
1878.....	63,494	56,065,202	1,778,667 09	186,071	169,002,693	3,181,631 65	4,960,298 74
1879.....	62,058	54,795,448	1,750,281 10	219,684	198,980,972	2,658,879 37	4,410,160 47
Eight years.....	611,555	540,113,065	17,733,911 42	1,296,849	1,199,778,627	22,675,325 69	40,409,237 11
Average yearly.....	76,444	67,514,133	2,216,738 92	162,006	142,472,328	2,884,415 71	5,061,154 63

From these statements it is seen that the average annual amount of earnings from "through" business over the two roads has been \$10,393,864.08. In this lies the most important question for the government to consider at the present time. Under the sinking-fund law, twenty-five per cent., of probably \$6,000,000, of this business is required to be paid into the Treasury by the companies, equal, say, to \$1,500,000 per annum. Should one-half only of this business be diverted to the new route, it would so reduce the net earnings of both companies, more especially those of the Central Pacific subsidized line, which has not a very large local business, that the government share would be reduced more than the one-half of the \$1,500,000 referred to. The matter is one of such importance as to demand the most careful consideration on the part of the government, as bound up in it is the question of security and ultimate payment, or the loss of the entire debt of these companies, which at maturity will probably amount to more than one hundred million dollars (\$100,000,000), even after all the compensation for transportation service has been applied thereon.

Another important question which has been suggested by the opening of the new route is that of the consolidation of the Central and Union Pacific systems of railroad, including the Southern Pacific. Without entering into any detailed discussion of this question of consolidation, it may be stated that the charter act authorizes such a consolidation to be made, if the companies themselves choose to do so; that the consolidation would seem to be much more necessary for the conservation of the property, and securing the government debt, of the Central Pacific subsidized line, than it does for that of the Union Pacific; and that its general effect upon both transcontinental and local business would be in the direction of lower rates, by reason of reduced expenses. Yet, should the consolidation take place, there would still remain the question of diversion of business to the new route, and its effect upon the interest of the government—as the consolidated company might divert business from the subsidized line just as much as though no consolidation was entered into—as a subject for the law-making power to deal with.

RAILROAD CORPORATIONS CHARTERED BY THE UNITED STATES TO WHICH NO BONDS, BUT LANDS ONLY, HAVE BEEN GRANTED.

These companies, the Texas and Pacific, the Northern Pacific, and the Atlantic and Pacific, are all of them now vigorously pushing on the construction of their lines. Only one of the properties has been examined during the year—the Northern Pacific—which company has continued to make full and free reports of all their operations and affairs to this office. The Texas and Pacific rendered its annual report, as called for by the provisions of its charter, on November 5, 1880, more than four months after the time prescribed by law. The Atlantic and Pacific Company has not rendered any reports to this office, but its successor in Missouri, the Saint Louis and San Francisco Railway Company, has rendered partial reports.

THE TEXAS AND PACIFIC RAILWAY COMPANY.

This company has a grant of land from the United States in the Territories of New Mexico and Arizona and in the State of California; but, not having constructed any railroad therein, no lands have been earned or acquired. No patents for lands have been issued to this company.

Section 13 of the act of Congress approved March 3, 1871 (16 Statutes at Large, 577), requires the president of the company to make an annual report by the first day of July, under oath, exhibiting the financial situation of the company, the amount of money received and expended, and the number of miles of road constructed each year; the names and residences of the stockholders, directors, and officers of the company, the amount of stock subscribed and actually paid in, a description of the lines of road surveyed and fixed upon for construction, the amount received from passengers and for freight, a statement of the expenses of said road and its fixtures, and a true statement of the indebtedness of said company, and the various kinds thereof.

In accordance with these requirements, the president of the company has made the following report for the year ending June 30, 1880 (the reports for 1878 and 1879 being given in Appendix V of this report):

Miles of road in operation :

Shreveport Division, from Shreveport to Marshall	39.96
Southern Division, from Marshall to Fort Worth	179.93
Jefferson Division, from Marshall to Texarkana Junction	69.05
Trans-Continental Division, from Texarkana, via Texarkana Junction, to Sherman	155.12
Rio Grande Division, from Fort Worth westwardly	40.00

Total miles in operation 433.86

The company has under contract about 575 miles of road, as follows:

	Miles.
From point reached on Rio Grande Division to El Paso	520
From Sherman via Whitesboro' to Denton	55
Total	575

All of the 483.86 miles of road in operation, with the exception of 19 miles within the State of Louisiana and 40 miles recently turned over by contractors, has been inspected by commissioners appointed by the government and duly accepted by the President of the United States.

There is filed with this report a copy of the ninth annual report of the board of directors of the Texas and Pacific Railway Company to the stockholders, covering in detail the operations of the company for its fiscal year ending May 31, 1880.

Receipts from all sources and how applied for the year ending June 30, 1880.

On hand June 30, 1879, balance from last annual report \$203,960 68

By receipts from—

Passengers	\$466,736 78
Freight	2,075,993 44
Express	22,456 45
Mail	41,622 36
Telegraph	11,090 24
Miscellaneous	5,367 50
	<u>\$2,623,266 77</u>

To payments for—

Conducting transportation	422,381 80
Motive power	316,348 81
Maintenance of cars	104,700 46
Maintenance of way	487,917 06
General expense	211,551 31
	<u>1,542,899 44</u>

By net earnings from operating road 1,080,367 33

By receipts from other sources:

From Texas land sales	\$144,330 28
Less income bonds and scrip received in payment for lands sold	140,167 88
	<u>\$4,162 40</u>
From town-lot sales	2,761 14
From interest on securities	26,843 76
From construction bonds	993,000 00
From capital stock	751,000 00
From adjustment of accounts (!)	542,283 09
From sundry securities	65,985 00
	<u>2,386,035 39</u>

Total 3,670,363 40

Against which there is charged—

For interest on bonds	\$662,520 00
For construction and equipment	1,498,604 35
For sinking fund, first mortgage bonds	71,040 00
For land department	29,668 06
For property account	200,830 00
For reduction of liabilities	890,724 02
For sundry accounts	22,159 48
	<u>3,375,545 91</u>

Balance on hand June 30, 1880:

Cash	\$56,908 65
Material	166,925 42
Due from agents	70,983 42
	<u>294,817 49</u>
	3,670,363 40

FINANCIAL CONDITION OF THE TEXAS AND PACIFIC RAILWAY COMPANY,
JUNE 30, 1880.

Capital stock authorized	\$50,000,000 00
Capital stock issued	8,653,500 00
Capital stock full paid	8,653,500 00

LIABILITIES.

First mortgage 6 per cent. gold construction bonds, Eastern Division, \$3,000 per mile, payable March 1, 1905	3,481,000 00
Consolidated mortgage 6 per cent. gold construction bonds, Eastern Division, \$17,000 per mile, payable June 1, 1905	7,619,000 00
Income and land grant 7 per cent. currency bonds, limited to an issue of \$3,908,000, dated —, payable June 1, 1905	8,276,000 00

First mortgage construction 6 per cent. gold bonds, Rio Grande Division, \$25,000 per mile, payable ———	\$751,000 00
Land grant bonds, old issue.....	138,000 00
Coupons old land grant bonds.....	42,665 00
Fractional bond scrip, convertible into bonds on presentation.....	38,824 10
Land department fractional scrip.....	928 58
Interest scrip.....	1,960 00
Unpaid coupons, first and consolidated mortgage bonds.....	3,570 00
Bills payable.....	50,000 00
School fund loan State of Texas.....	181,677 64
Sinking fund first mortgage bonds, payable October 1, 1880.....	69,620 00
Current balances.....	166,943 79

Total liabilities payable in cash.....	20,821,189 11
--	---------------

Scrip issued for interest on income and land grant bonds, and redeemable only in capital stock or lands.....	2,119,150 00
--	--------------

ASSETS.

Property account.....	406,908 50
Bills and accounts receivable.....	88,219 34
Cash in treasury.....	56,908 65
Material on hand.....	166,925 42
Land department.....	113,563 74
Total.....	832,605 65

Add 484 miles of constructed and equipped road and telegraph line, the value of which does not fully appear on our books because of unadjusted balances, but the construction accounts show an expenditure of \$28,925,840.90. Also, 4,755,862 acres of land in Texas and about 4,000 acres in California, a portion only of which has been valued.

The president of the company also reports equipment on hand as 54 locomotives and 1,060 cars; he also gives the names and residences of the stockholders, officers, and directors of the company.

THE NORTHERN PACIFIC RAILROAD COMPANY.

The entire property of this company has been inspected by the engineer of this office during the year, who gives a very full report, covering the lands as well as the railroad and appurtenances.

On June 30, 1880, the company was operating 781 miles of railroad, but had about 100 miles of additional road ready for acceptance by the President of the United States.

On the Eastern Division the company has constructed 175 miles of railroad during the calendar year and nearly 125 miles on the Pend d'Oreille Division, and has probably 200 miles more under contract.

The President accepted 100 miles of the road west of Bismarck, or rather west of the Missouri River at that point, on August 16, 1880, and commissioners have been appointed to examine and report on a section of 50 miles farther west on the same line. The report of the commissioners who examined the 100 miles which have been accepted speaks favorably of the character of the road and of the country through which it passes. Some bridges, which are considered not quite up to the factor of safety in the best practice, will be strengthened when renewal is required. The track has been laid with American iron, made from American ore, in conformity with law.

The railroad of the company has been divided as follows for operation and other purposes:

	Miles.
Wisconsin Division (projected) from Thomson east to Montreal River	120
Minnesota Division (in operation) Duluth to Fargo	254
Saint Paul Division (in operation) Saint Paul to Brainerd	136
Dakota Division (in operation) Fargo to Bismarck	194
Missouri Division (constructed and partially operated) Bismarck to Green River ..	104
Missouri Division (under construction) Green River to Glendive Creek	113
Yellowstone Division (partially located) Glendive Creek to Shield's River	340
Rocky Mountain Division (not finally located) Shield's River to Deer Lodge City ..	209
Clark's Fork Division (not finally located) Deer Lodge to Lake Pend d'Oreille ..	280
Pend d'Oreille Division (under construction) Lake Pend d'Oreille to Ainsworth ..	209
Columbia River Division (constructed) Ainsworth to Wallulu	12
Columbia River Division (not located) Ainsworth to Kalama	250
Cascade Mountain Division (not finally located) Ainsworth to Wilkeson	240
Cascade Mountain Division (in operation) Wilkeson to Tacoma	31
Pacific Division (in operation) Tacoma to Kalama	105
Casselman Branch (in operation) Casselman to Elm River	31
Total miles constructed and projected	2,619

Of this grand total finished and projected, the following table gives a better idea of the progress which has been made:

	Miles.
In operation	855
Constructed and ready for operation	87
Under construction	247
Partially located	340
Not finally located	720
Not located	250
Projected	120
Total	2,619

Of the road in operation in Minnesota and Dakota—450 miles—from Duluth to Bismarck the grades are light, and much the larger portion tangent, without tunnels, heavy fills or deep cuts, the country being comparatively level. Steel rails have been used to replace iron on that portion of the road where the traffic is heaviest, west of Brainerd and between Brainerd and Saint Paul. The main shops of the company are at Brainerd, where the company has also a substantial and well-arranged building for officers and a fine hotel. With the increase of business and rolling stock the shops at Brainerd must be enlarged, as they are even now quite too small. Brainerd is probably as good a point on the road as can be selected for the purpose, as it must soon become a great lumber market, has the Mississippi River for water supply and drainage, and is well located.

The equipment of the Eastern Division was found in excellent condition, passenger cars supplied with Miller platforms and Westinghouse automatic brakes.

Within a reasonable time and as the requirements of traffic demand, the company proposes to build an iron bridge over the Missouri River at Bismarck, which will be 1,400 feet long, and to cost not over \$1,000,000.

The company is building in Saint Paul a first-class structure to be used as general operating offices, and is providing terminal facilities, and buildings necessary for the large freight business which, during the winter season and the suspension of lake navigation, must have its outlet some other way.

The lands of the company in Minnesota and Dakota east of the Missouri River are purchasable with preferred stock at par; lands between the Missouri and Yellowstone are purchasable with bonds issued on the

Missouri Division, or for \$2.60 cash per acre by actual settlers—and so also with the land of the Pend d'Oreille Division in Washington Territory.

As shown by Table No. 10, the estimated grant of public lands to the company is 42,000,000 acres. Of this quantity but 746,509 acres have as yet been patented to the company, although some 2,593,983 acres have been sold to June 30, 1880, the sales for the fiscal year amounting to 304,276 acres at an average price of \$2.67 per acre, realizing \$812,521 and averaging for all sales to date \$3.50 per acre, which gives the large sum of \$9,089,454 already realized from the land grant.

The company has remaining 39,406,000 acres of land, which, at \$2.50 per acre, will realize the sum of \$97,515,000.

So far as seen the lands granted to this company are worth much above the average of those granted to the other Pacific railroad companies. In Minnesota, in Washington Territory, and in Montana, the timber lands embraced in the grant will be undoubtedly of great value when the railroad is built—without the road their value is more nominal than real; and the same may be said of their coal lands in Dakota and Washington Territories. From Fargo, on the Red River of the North, to the Little Missouri, a distance of 350 miles, all in the Territory of Dakota, lie some 9,000,000 acres of the company's lands, all of which is probably as good an average quality of wheat land as can be found anywhere. From Ainsworth to Spokane Falls, in Washington Territory, some 125 miles, probably two-thirds of the land is equally good wheat land with that found in Dakota, being much the same as that in the vicinity of Walla-Walla, now celebrated for the excellence of both the quantity and quality of its crops. Mr. Nichols' remarks on the character of the company's land are interesting and instructive.

The receipts and expenditures of the company for the fiscal year have been as follows:

Northern Pacific Railroad Company, 781 miles operated.

(Year ending June 30, 1880.)

RECEIPTS.

Commercial passenger.....	\$524, 184 55	
Commercial freight.....	1, 568, 613 39	
United States mail.....	41, 328 91	
Express.....	40, 303 85	
Miscellaneous.....	4, 625 66	
		\$2, 179, 056 36
Gross earnings Pacific Division (six months).....		51, 521 01
Total earnings.....		2, 230, 577 37
Profits on stocks held.....	19, 721 00	
Dividends on stocks held.....	5, 010 00	
Sales of bonds.....	1, 421, 331 13	
Sales of bond certificates, Missouri Division.....	1, 803, 959 51	
Sales of bond certificates, Pend d'Oreille Division.....	730, 911 17	
Interest and exchange.....	737 77	
Receipts from land:		
Preferred stock.....	278, 386 89	
Bond certificates.....	3, 940 00	
Cash.....	141, 749 65	
Income receipts.....		4, 408, 747 12
Total receipts from all sources.....		6, 639, 324 49

EXPENDITURES.

Conducting transportation.....	\$304,639 55	
Maintenance of way.....	459,818 54	
Motive power.....	333,991 84	
Maintenance of cars.....	78,628 45	
General expenses and taxes.....	210,098 53	
		\$1,387,776 91
Expenses Pacific Division (six months).....		21,377 84
Total operating expenses.....		1,409,154 75
Income expenditures:		
Interest on first-mortgage bonds.....	147,478 05	
Interest on other debt.....	12,795 98	
New construction.....	3,201,470 13	
New equipment.....	212,032 72	
Improvements and betterments.....	157,525 44	
Expenses of land department.....	75,180 67	
Rentals of leased lines.....	197,165 91	
Total income expenses.....		4,003,648 90
Total expenditures.....		5,412,803 65
Surplus receipts over expenditures.....		1,226,520 84

The earnings and operating expenses for the fiscal year were as follows, details being given in Table No. 11:

Earnings, 721 miles operated.....	\$2,230,577 37
Operating expenses and taxes.....	1,409,154 75
Net earnings.....	821,422 62

For the eight months ending August 31, 1879 and 1880, as shown in detail in Table No. 11, the earnings and expenses have been as follows:

	Eight months, 1880.	Eight months, 1879.
Earnings.....	\$1,399,398 99	\$1,113,102 73
Expenses.....	1,017,427 94	759,667 08
Net earnings.....	381,971 05	354,045 65

The financial condition of the company on June 30, 1880, is exhibited in the following statement of its assets and liabilities:

LIABILITIES.

First-mortgage bonds:		
Missouri Division.....		\$2,283,894 76
Pend d'Oreille Division.....		1,597,939 65
Bills payable.....		489,983 45
Accounts payable.....		915,883 65
Capital stock:		
Common.....	\$49,000,000 00	
Preferred.....	43,412,645 12	
		92,412,645 12
Surplus, derived from land sales, &c.....		9,350,349 36
		107,050,695 99

ASSETS.

Road, fixtures, and lands	\$95,697, 159 94
Equipment	1, 243, 531 05
Improvements and betterments	979, 429 58
Fuel, material, and stores on hand	1, 894, 636 13
Cash	401, 824 53
Bills receivable	1, 760 28
Accounts receivable	705, 268 57
Company's and other stocks and bonds	6, 127, 085 86
Total	107, 050, 695 99

The number of stockholders of this company December 31, 1879, was 8,139, and June 30, 1880, they are reported "about 8,000"; quite a large number compared with that of other important companies, the Texas and Pacific having but 57, the Southern Pacific 36, and the Central Pacific prior to February, 1880, probably not over 50; the Union Pacific (consolidated) had 1,509 on June 30, 1880, a much larger number than ever before, and composed of a goodly number of small holders who had evidently taken stock for permanent investment purposes. The number of shares of the Northern Pacific outstanding September 30, 1880, being 934,126, and the votes cast for election of directors being but 355,967, shows that but little more than one-third of the stock was voted at the annual election. This is, or has been, at least, in all probability, one of the main causes of the apparent lack of energy on the part of this company during the years immediately following the reorganization of the company September 29, 1875.

Referring to these matters leads to some reflections in regard to the general policy of the company in the past and present. The property which came into possession of the company by purchase August 25, 1875, under foreclosure, and by which they acquired all the rights and franchises of the corporation created by act of Congress approved July 2, 1864, was 530 miles of railroad in operation and an undivided one-half interest in 24 miles from Duluth to Thomson, Minn., together with all the equipments and other property; that is, a railroad from Duluth to Bismarck, and another from Kalama to Tacoma, in Washington Territory. In the interval between September, 1875, and September, 1879, four years, but 31 miles of railroad were constructed by the company, and that merely a coal-branch, which, by reason of a questionable selection of a mining engineer, has been practically without business or profit! In addition to this, the company had leased the Saint Paul and Brainerd line, 136 miles, making the total road operated 691 miles, and that also up to the 30th of June, 1880! It is matter of surprise that the opportunity for occupying the country now held by the Saint Paul, Minneapolis and Manitoba Company was not seized by this company; that the company did not at the very earliest moment make good, by its control of the Saint Paul and Pacific stock, its connection with Saint Paul; that it did not promptly take in the situation, and build its road from both Tacoma and Portland to Ainsworth!

Congress, by joint resolution, approved May 31, 1870 (16 Statutes, 378), gave the company authority to mortgage its entire property—"its property and rights of property of all kinds and descriptions, real, personal, and mixed, including its franchise as a corporation." Yet, with this great authority to hand, the company has, to within a period quite recent, failed to appreciate its opportunities, and has been placing piecemeal mortgages upon its property, a plan which, in view of the possibilities open to this great enterprise, cannot be considered as anything short of obstructive and complicating.

A prime necessity, both for the company and for the country through which its railroad has been located in Washington Territory and Oregon, is the immediate construction of its line eastward through the Cascade Range, and westward from Ainsworth down the valley of the Columbia, on its south bank, to Portland. The line to Ainsworth from Tacoma will open up the lumber country and the coal lands for the use of the wheat-growing communities centering at Walla Walla and other points, while the products of that country will find their export on the Sound. No rivalry as between the Sound and Portland should be permitted to interfere with the construction of both these lines. There will be business enough for all; and as the company builds its road eastward, with a base of supplies at Tacoma, the transportation will always be at hand, and the profit of it, if any, go into their own coffers. That any other policy was adopted, especially such a one as building east from Ainsworth and depending upon the navigation of the Columbia River, with its innumerable difficulties and delays, was hardly short of being suicidal, or of placing themselves entirely under the control of a rival company.

It is assuring, however, to know that a new departure has been taken under the vigorous leadership of the present able presiding officer of the company, and that the most energetic means will be adopted to push the whole work with vigor during the coming year. Congress having given the company the right to mortgage all its property and rights of property, which it would seem, beyond question, must include the lands granted, reserving only the right "to alter and amend" (not to repeal), and that with "due regard to the rights of said company, and any other parties," will hardly be disposed to interfere in any way with the work of completion of this great undertaking.

In view of the absolute security afforded to bondholders of the Missouri and Pend d'Oreille divisions by virtue of the large land grant, in addition to the railroad property itself, the credit of the company should have been better than to have necessitated the donation of 74 per cent. (!) of preferred stock at par value, in placing the loan of \$2,500,000 each on those two divisions. The six per cent. bonds of this company, secured by a first mortgage on the entire property, with a sinking fund provided from the sales of lands, ought to command the attention of capitalists at par. The later issues of bonds have been taken at 95 and interest without any preferred stock.

The company complains of the non-fulfillment of the stipulations in the charter in regard to prompt surveys of the lands through which the road is built. Section 6 of the charter act (15 Statutes, 339) says: "The President of the United States shall cause the lands to be surveyed for forty miles in width on both sides of the entire line of said road, after the general route shall be fixed, and as fast as may be required by the construction of said railroad." Surveys must precede settlement and sales, both of the government and company lands.

In conclusion, as regards the present management of the Northern Pacific—their methods both of operation and accounting—it is due the company to say that nothing has been withheld from this office, and that no other company is believed to have a straighter or a more honest and honorable record than their books exhibit.

THE ATLANTIC AND PACIFIC RAILROAD COMPANY.

This company has been reorganized, or rather revitalized, and has begun the construction of their railroad from Albuquerque, N. Mex., westward.

Fifty miles of the railroad are completed and ready for the examination of the commissioners to be appointed by the President of the United States for that purpose.

From the fact that a period of eight years had elapsed since the construction of any portion of this railroad, you were pleased to direct that the question of appointment of commissioners to examine the newly-constructed railroad and the collateral questions of acceptance of the road, and of patenting lands earned by the company, be submitted to the honorable the Attorney-General for his opinion. The opinion of the Attorney-General is given in Appendix D of this report, in which it is held—

That the grant to the railroad has not been forfeited by its failure to build its road within the time named in the act, no action by reason of its failure to perform its conditions having been taken by authority of Congress. It having, then, a present grant, even if it be treated as one liable to forfeiture, it has still a right to proceed to construct the road; and until, in some form, advantage shall be taken of the breach of the conditions, it would be the duty of the Executive Department to give it the benefit of the grant.

Also—

That it would be within the power and duty of the Executive to appoint commissioners to examine the section of road submitted by the Atlantic and Pacific Railroad Company, to accept the same if completed in all respects required by the act of July 27, 1866, and to cause patents to be issued to said company for lands situated opposite to and coterminous with the section of road if completed.

SAINT LOUIS AND SAN FRANCISCO RAILWAY COMPANY.

A portion of the original Atlantic and Pacific Railroad is now owned and operated by the Saint Louis and San Francisco Railway Company, and was inspected during the current year. The property was found in reasonably good condition, some 130 miles of the road being laid with steel rails, a considerable portion of the whole road being ballasted with broken stone or gravel, the bridges and masonry being in good order generally, and the equipment in good repair and supplied with "Westinghouse" air-brakes and "Miller" platforms for passenger service, a more detailed report of which is given by the engineer.

The business of this company, consisting chiefly of Texas traffic and the transportation of ore from the mining country through which its road runs to Saint Louis, has increased wonderfully during the past year. For the years ending June 30, 1880, and 1879, as shown more in detail in Table No. 11, the gross and net earnings have been as follows:

Fiscal years—	Gross earnings.	Net earnings.
1880	\$2,250,564 57	\$1,262,863 00
1879	1,183,318 96	575,734 77
Increase 1880 over 1879	1,076,217 61	677,128 92

And for the nine months ending September 30, 1880, and 1879:

Nine months—	Gross earnings.	Net earnings.
1880	\$1,857,337 21	\$931,276 83
1879	1,032,019 57	536,928 10
Increase	825,317 64	394,348 78

OTHER ROADS INSPECTED AND REPORTED ON.

Among the other properties inspected during the year are those of the Oregon and California, the Oregon Central, the Missouri, Kansas and Texas in Kansas, the Atchison, Topeka and Santa Fé, and the Saint Paul and Duluth Railroad Companies, details of which will be found in the report of the engineer. That portion of the Southern Pacific termed Northern Division, and not operated by the Central Pacific, was not examined in detail.

SOUTHERN PACIFIC RAILROAD, NORTHERN DIVISION.

The following statements exhibit the earnings and expenses of the Northern Division of the Southern Pacific Railroad, and the financial condition of the company:

Southern Pacific Railroad Company.

(Year ending June 30, 1880.)

RECEIPTS.		
Passenger earnings.....	\$399,349 34	
Freight earnings.....	455,382 51	
Mail earnings.....	11,865 76	
Express.....	12,250 56	
Miscellaneous.....	23,478 31	
Gross earnings, Northern Division.....		\$902,326 48
Profits on investments.....	348,964 93	
Receipts of land department.....	108,786 26	
		457,751 19
Total receipts.....		1,360,077 67
Rental paid by Central Pacific Railroad Company.....		1,632,544 93
Total.....		2,992,622 60
EXPENDITURES.		
Conducting transportation.....	\$205,925 89	
Maintenance of way.....	135,742 44	
Motive power.....	143,598 72	
Maintenance of cars.....	40,130 68	
General expenses and taxes.....	231,286 15	
Total operating expenses, Northern Division.....		756,683 88
Interest on first-mortgage bonds.....	1,751,160 00	
Interest on other debt.....	121,320 39	
Expenses of land department.....	25,447 26	
Renewals on leased lines.....	859 52	
New construction.....	62,491 26	
New equipment.....	59,260 57	
		2,020,539 00
Total expenditures.....		2,777,222 88
Surplus income.....		215,400 72

Southern Pacific Railroad Company.

(June 30, 1880.)

LIABILITIES.		
First-mortgage bonds.....	\$28,872,000 00	
Interest due and unpaid.....	219,450 00	
Interest accrued.....	433,080 00	
Pay-rolls and vouchers.....	60,874 86	
Accounts payable.....	493,940 21	
Capital stock.....	36,763,900 00	
Total.....		66,843,245 07

ASSETS.

Road and fixtures.....	\$62,307,813 96
Equipments.....	1,848,533 51
Real estate.....	611,295 74
Fuel, materials, &c.....	111,086 49
Cash.....	3,532 72
Stocks of other companies.....	425,000 00
Due from United States.....	3,100 14
Bills receivable.....	30,000 00
Accounts receivable.....	586,152 70
Total.....	65,926,515 34
Deficit to date.....	916,729 73
	66,843,245 07

During the year the company has kept the property in good condition and has acquired possession of a branch road extending from Castroville to Monterey, at which latter point—on the Pacific Ocean—a magnificent hotel for summer resort has been built and opened. The business of this road has remained much the same as it was in the previous year, California not having as yet participated in the increased business activity of the country at large. Table No. 11 shows the earnings and expenses of this company for various periods.

OREGON AND CALIFORNIA AND OREGON CENTRAL RAILROADS.

The property of these companies is reported on in detail by the engineer. The Oregon and California Railroad has a grant of lands from Portland south to the boundary of the State of Oregon, and the design was that it should there connect with the Oregon branch of the Central Pacific, previously known as the California and Oregon Railroad. Both of these roads, the one in Oregon and the one in California, are unfinished, and, owing to the circuitous line proposed in the maps of general route, they have not been accepted by the department, and no lands have been withdrawn north of Redding in California or south of Roseburg in Oregon, a distance probably of 300 miles. Furthermore, the time for the completion of the roads has expired.

The principal business of these roads, the Oregon and California and Oregon Central, is the transportation of wheat, flour, and wood northward, but the failure of crops in the Willamette Valley in recent years and the consequent migration have so reduced their business that it has been quite a difficult matter to earn enough money to keep the property in repair.

The earnings and expenses are given in the tables attached to this report, as well as other information in regard to the condition of the property and the financial condition of the company.

MISSOURI, KANSAS AND TEXAS RAILWAY.

At the time of inspection this road, including 183 miles of land grant railroad in Kansas, was operated by the Union Trust Company of New York, trustees.

The Kansas property was found in good condition generally—bridges in good repair and properly supplied with guard rails and floors, road-bed and track well kept up, passenger equipment fitted with Miller platforms and Westinghouse air-brakes, and shops and other buildings at Parsons substantially constructed and in good repair.

The business of this company consists chiefly in the transportation of grain, live stock, lumber, coal, and cotton, and is likely to be very large in the near future.

The comparative statement of earnings and expenses, details of which are given in Table No. 11, shows the following results:

NINE MONTHS ENDING SEPTEMBER 30.

	Gross earnings.	Net earnings.
1880	\$3,025,774 74	\$1,588,806 05
1879	2,188,568 08	931,786 40
Increase 1880 over 1879	837,206 66	657,019 65

YEAR ENDING JUNE 30.

	Gross earnings.	Net earnings.
1880	\$4,082,322 92	\$2,158,324 20
1879	2,978,735 06	1,129,363 97
Increase 1880 over 1879	1,103,587 86	1,028,958 23

THE ATCHISON, TOPEKA AND SANTA FÉ RAILROAD.

This road from Atchison to Pueblo was partially inspected in the month of May last, but owing to the lack of facilities afforded for examining the property, it became a very unsatisfactory inspection. This is the more to be regretted for the reason that the line is an important link in the new trans-continental route.

The road subsidized extends from Atchison to the western boundary of Kansas; but the company operates and virtually owns and controls 844 miles of other railroad. This company has also taken part in the construction of the Atlantic and Pacific Railroad west from Albuquerque, N. Mex., and is building an extension from Albuquerque southward into Mexico, the objective point of which is Guaymas on the Gulf of California.

The maximum grade of the main line in Kansas is 63.7 feet, the sharpest curve is 6 degrees, and about 388 miles of the 471 are tangent.

The number of ties to the mile is below the requirements of the department, and the road should not have been accepted in such condition—the weight of rail used, 56 pounds, requiring 2,640 ties to the mile in good practice. Renewal of ties has not been sufficient, there being a great many rotten ties still in the road.

The iron is badly worn in many places and large renewals will be necessary in a short time. That portion of the road between Atchison and Topeka, on which the traffic is light, has been allowed to run on, and is rough and in general bad order. The road west of Topeka is in better order and has quite a considerable portion laid with steel.

The bridges on the road appear to be in good condition, and many of them have well laid oak floors and guard-rails.

The engine-houses, shops, water-tanks, coal-chutes, and other buildings are in fair condition, and the equipment is kept in good order. Passenger-cars are fitted with "Westinghouse" automatic brakes and "Miller" platforms.

The business of the company is principally the carrying of grain, coal, lumber, and live stock. Two-thirds of the freight traffic is westward.

Detailed comparative statements of the earnings and expenses are given in Table No. 11, which show an extraordinary improvement, of which the results are as follows:

Fiscal years ending June 30—	Miles.	Gross earnings.	Net earnings.
1880.....	1,190	\$7,362,790 66	\$4,168,304 17
1879.....	852	5,195,308 64	2,650,522 87
Increase 1880 over 1879	338	2,167,482 02	1,517,781 30

Of a total tonnage carried, amounting to 872,025, 170,138 tons were construction and railroad material, and 8,431 tons were government freight.

The company reports 1,158,083 acres of land sold to June 30, 1880, and 1,480,370 remaining unsold. Sales of land to same date have amounted to the sum of \$5,802,955.98, or an average price of \$5.0275 per acre.

The financial condition of the company on December 31, 1879, is shown by the following statement:

LIABILITIES.

First-mortgage bonds.....	\$7,041,000 00
Interest on same	248,377 50
Other bonded debt	7,173,400 00
Interest due and accrued	50,815 54
Bills payable.....	333,760 04
Accounts payable.....	1,159,255 51
Pay-rolls and vouchers	769,946 39
Due other companies	115,059 88
Dividends unpaid	379,173 00
Capital stock	12,634,400 00
	<hr/>
	29,905,237 86
Surplus, or credit to income account	2,050,693 67
	<hr/>
	31,955,931 53

ASSETS.

Road and fixtures	22,482,061 05
Equipment	2,584,239 36
Fuel, materials, &c	385,542 02
Cash	378,662 17
Company's stock and bonds.....	145,822 06
Other stocks and bonds	2,239,789 55
Due from the United States	201,741 62
Bills and accounts receivable	3,066,353 89
Due from other companies.....	48,250 51
Miscellaneous investments.....	454,519 30
	<hr/>
	31,955,931 53

SAINT PAUL AND DULUTH RAILROAD COMPANY.

The road of this company extends from Saint Paul to Duluth, Minn., 156 miles, of which the Northern Pacific Railroad Company owns an undivided half interest in 24 miles, from Duluth to Thomson.

The engineer reports the line as badly located in detail, with sharp reversions, grades heavy, track out of line, joints down, and splices loose.

Between Duluth and Thomson are five very high trestle-bridges, three

of which have been rebuilt during the year. All bridges on this road are provided with guard-rails.

Passenger equipment is supplied with "Miller" platforms and "Westinghouse" automatic brakes.

The company is expending large sums in maintenance, as shown by the detailed reports given in the tables accompanying this report.

THE TABLES ATTACHED TO THE REPORT.

The tables placed after the appendixes have been carefully prepared from the reports rendered by the companies, and from such other sources as were attainable. Table No. 1 gives the organization—names of companies, date of charter or consolidation, names of companies consolidated with, previous incorporation, miles of road owned, roads leased, controlled, or operated, giving names, miles, and terms, and total miles operated; Table No. 2 gives the ownership—names of companies, number of stockholders, par value of stock, capital stock authorized, capital stock subscribed, capital stock issued, total issued and owned by company; Table No. 3 gives the names of officers of the several companies, president, secretary, treasurer, general executive officer, and general accounting officer; Table No. 4 gives the characteristics of roads; Table No. 5 gives cost of property and character of equipment; Table No. 6 gives statistical information in regard to the bonds issued by the subsidized Pacific Railroad companies; Table No. 7 gives liabilities and assets of the companies which have rendered reports; Table No. 8 gives revenue as reported; Table No. 9 gives expenditures as reported; Table No. 10 gives operations of land departments; and Table No. 11, comparative statements of earnings and expenses.

CONGRESSIONAL PROCEEDINGS AFFECTING THE PACIFIC RAILROADS, AND RECOMMENDATIONS FOR LEGISLATION.

During the second session of the Forty-sixth Congress, which adjourned June 16, 1880, two bills were introduced which specially affected the subsidized Pacific Railroad companies—H. R. Nos. 4233 and 4558.

The bill No. 4233 was reported to the House February 5, 1880; was read twice, recommitteed to the Committee on the Pacific Railroad, and ordered to be printed. The bill is virtually a series of amendments of the sinking-fund law of May 7, 1878, making the following changes:

First. By section 3 of the bill the Secretary of the Treasury is authorized to invest the sinking fund in "bonds of the United States or in the first-mortgage bonds of said companies, respectively, as the Secretary may prefer." The question of investment in the first-mortgage bonds of the companies was debated in the House on April 19, 1880 (Congressional Record, April 12, 1880, pages 9-13). The law now requires the sinking fund to be invested "in bonds of the United States. * * * And in making such investments the Secretary shall prefer the five per centum bonds of the United States, unless, for good reasons appearing to him, and which he shall report to Congress, he shall at any time deem it advisable to invest in other bonds of the United States." The "5 per cent. bonds" of the United States are redeemable in 1881; the "currency sixes" are bearing a premium of from 30 to 35 per cent.; and the "four per cents" are worth 112; while the first-mortgage six per cent. bonds of the companies are selling at 114. The sinking fund is to be used *first* in payment of the first-mortgage bonds (section 8, 20 Statutes, 56). "Only one-half of the compensation for services shall be required to be

applied to the payment of the bonds issued by the government in aid of the construction of said roads" (section 5, 13 Statutes, 356). The other half, therefore, which is credited to the sinking fund, is the company's money.

Second. By section 4 the time for crediting to the sinking-fund amounts found due the companies is changed from *February first in each year*, to the *date of settlement by the accounting-officers; semi-annual settlements* with the companies are provided for, instead of *annual settlements*; the time for payment of moneys by the company is changed from *February first in each year*, to *April first and October first*—the time for settling, thirty days, being too short; and the same section provides proportionately similar sinking-funds for the Kansas Pacific, Sioux City and Pacific, and Central Branch Union Pacific companies.

The changes in regard to the practical work under the sinking-fund law are necessary and just. As to the creation of sinking-funds for the other three companies named, it is for Congress to determine.

Third. Section 5 provides—

That the Secretary of the Treasury be, and he is hereby, authorized to transfer to the sinking-fund established by this act, out of any moneys in the Treasury of the United States due to either of said railroad companies, respectively, for services and not lawfully retainable on account of interest on bonds issued to said companies by the United States, or on account of five per centum of net earnings, such sums as may be required under the provisions of this act to be paid by said companies, respectively, into the Treasury to the credit of said sinking-fund; and all laws inconsistent with the provisions of this section so far as relates to the said companies are hereby repealed.

This section is necessary in order that the sinking-fund may obtain its proper credits, large sums of money being payable to the companies for services on unsubsidized railroads, but which they are willing to have applied as a cash payment by them; otherwise the money will have to be paid to the companies and then the companies repay the money into the Treasury for credit to the sinking-fund. It is simply a matter of bookkeeping; the courts having decided that only the subsidized road is liable to the "five per cent." of net earnings.

The bill No. 4538 was reported to the House February 18, 1880, read twice, recommitted to the Committee on the Pacific Railroad, and ordered to be printed. The following sections of this bill are now recommended for legislative action:

SECTION 1. That the title "Commissioner of Railroad Affairs" shall be, and is hereby, substituted for that of "Auditor of Railroad Accounts" in section two of said act of Congress approved June nineteenth, anno Domini eighteen hundred and seventy-eight; and in all other sections of the said act the title "Commissioner" shall be, and is hereby, substituted for that of "Auditor."

SEC. 2. That the Secretary of the Interior shall appoint in the office of the said Commissioner of Railroad Affairs one railroad engineer at an annual salary of three thousand dollars, and the duties of said railroad engineer shall be to inspect the properties of the railroad companies named in the said act, as often as may be required, and to make a report thereon to the said Commissioner on the first day of November in each year.

SEC. 3. That the several departments of the government for which the Union Pacific, Central Pacific, Kansas Pacific, Central Branch Union Pacific, and Sioux City and Pacific Railroad Companies shall have performed, or may hereafter perform transportation service of any kind, including the transportation of the mails, are hereby required, after the accounts for said transportation have been examined and approved in the respective bureaus of the several departments for which the service has been performed, to forward the said accounts to the proper accounting-officers of the Treasury through the Commissioner of Railroad Affairs; and any and all disallowances or differences found in the said accounts by the accounting-officers of the Treasury shall be reported to the said Commissioner for his information.

SEC. 4. That the Commissioner of Railroad Affairs be, and is hereby, required, within a reasonable time after he shall have received the reports of the accounting

officers referred to in the preceding section, to report to the Secretary of the Treasury for his information any facts affecting their correctness or the proper disposal of the moneys found due to said railroad companies respectively.

SEC. 5. That all transportation accounts rendered to the several departments of the government by the railroad companies named in section three of this act be, and the same are hereby, required to be delivered to the accounting officers of the Treasury within thirty days from the date of receipt of the same; and the said accounting officers are hereby required to have the said accounts settled and reported on as provided in section three of this act within thirty days after the said accounts have been received by the said accounting officers.

SEC. 6. That section thirteen of the act approved July twenty-seventh, eighteen hundred and sixty-six, United States Statutes at Large, volume fourteen, page two hundred and ninety-seven, so far as the same relates to reports to be rendered by the Atlantic and Pacific Railroad Company to the Department of the Interior be, and is hereby, repealed.

SEC. 7. That section thirteen of the act approved March third, eighteen hundred and seventy-one, United States Statutes at Large, volume sixteen, page five hundred and seventy-seven, relating to reports to be made by the Texas and Pacific Railway Company to the Department of the Interior be, and is hereby, repealed.

SEC. 8. That the office of government director of the Union Pacific Railroad be, and the same is hereby, abolished.

SEC. 9. That the several departments of the government are hereby authorized and empowered to enter into contracts or agreements with such of the companies or persons who own or operate the aforesaid railroads respectively or with any other railroad company or common carrier as may choose so to do, for the transportation of freight and passengers at some average and reasonable rate per passenger per mile and per ton of freight per mile regardless of classification: *Provided*, That in no case shall said average rates be greater than the average rates received by said companies respectively for the fiscal or calendar year immediately preceding that for which said contracts or agreements may be entered into: *And provided further*, That said contract rates shall be subject to all lawful conditions now in force in regard to any railroad or railroad company.

SEC. 10. That the Secretary of the Treasury be, and he is hereby, authorized, out of any moneys in the Treasury of the United States not otherwise appropriated, to pay to said railroad companies, respectively, such sums as may be found due to them for one-half of the compensation for services rendered for the government and not retainable on account of five per centum of net earnings, subject to the provisions of the act of Congress entitled "An act to alter and amend the act entitled 'An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes,' approved July first, anno Domini eighteen hundred and sixty-two, and also to alter and amend the act of Congress approved July second, anno Domini eighteen hundred and sixty-four, in amendment of said first-named act," approved May seventh, anno Domini eighteen hundred and seventy-eight, and of all acts amendatory thereof.

SEC. 11. That this act shall be taken to be and shall be in amendment of the act of Congress entitled "An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes," approved July first, anno Domini eighteen hundred and sixty-two, and of the act of Congress approved July second, anno Domini eighteen hundred and sixty-four, in amendment of said first-named act, and of all other acts amendatory thereof, and of the aforesaid act approved June nineteenth, anno Domini eighteen hundred and seventy-eight, in so far as their provisions are inconsistent with the provisions of this act; and in so far as the provisions of any of the aforesaid acts, or of any other act of Congress, are inconsistent with the provisions of this act the same are hereby repealed.

SEC. 12. That this act shall take effect from and after the date of the passage thereof.

As to this proposed legislation, of both bills, the reasons upon which it was urged in my last annual report (pages 50 to 54) apply now, but much more forcibly.

In regard to the land-grant railroads on which the United States is entitled to transportation of troops and supplies "free of toll or other charge," some legislation similar to that embodied in the sundry civil appropriation act approved March 3, 1879, is required. The decision of the Court of Claims in the "Atchison, Topeka and Santa Fé" case is given in Appendix M. In accord with this decision and the previous action of Congress, it is recommended that sufficient appropriation be made to

enable all of these companies to be paid *fifty per centum* of their ordinary charge for government transportation, with a proviso that, if accepted, it be in full of all demands and claims upon the government for such service. No doubt many of the companies would prefer settlement in this way rather than be subjected to the tedious process of the courts, where a final decision may not be reached for some years, and more especially for the reason that the land-grants are growing more valuable, those at least of the companies whose lands are not mainly disposed of.

As a matter probably affecting the Pacific Railroads more than any other, by reason of their great length and passing through so many States and Territories, it is further recommended for the consideration of the law-making branch of the government that, in view of the widespread demand for some legislation to prevent discriminations in the charges made by common carriers for the transportation of merchandise between the States, or what is generally termed "inter-State commerce," and the full and protracted discussions of the subject which have been had in Congress and before committees during the last two sessions, that the act of Congress approved June 15, 1866 (14 Statutes, 66, now section 5258 Revised Statutes), entitled "An act to facilitate commercial, postal, and military communication among the several States," and in which Congress reserved the right "at any time to alter, amend, or repeal," be amended so as to provide as follows, namely:

First. For some plain and uniform system of reports from all companies doing inter-State business.

Second. For a special report in regard to accidents on railroads and railroad trains, giving deaths and injuries, &c.

Third. For a special commission, composed of a judicial officer, an engineer, and a business man, to investigate the facts connected with every accident attended with death of any passengers; and

Fourth. That all common carriers engaged in transporting passengers and freight from one State or Territory to another State or Territory of the United States are hereby authorized to charge and receive for said service such compensation as they may fix from time to time: *Provided*, that no discrimination of any kind whatsoever shall be made; that like possible service and facilities shall be furnished on the same day at the same price for all freight offered; and in case any common carrier evades or breaks this provision, the party injured shall have his remedy in any United States district or circuit court having jurisdiction.

THE PERSONNEL AND EXPENSE OF THE BUREAU.

Since the close of the fiscal year Mr. Southwick Guthrie has resigned his position as "bookkeeper," Mr. August Duddenhausen has resigned his position as "assistant bookkeeper," both having obtained more lucrative positions, and it is feared that the inadequate pay attached to the office of railroad engineer will not enable the services of Mr. Aurin B. Nichols to be retained longer than the first of January next. These positions are very difficult ones to fill at the salaries, owing to the complicated and varied nature of the work and the necessity of having experienced men—such men as can command from railroad and commercial companies much higher salaries than the government seems willing to pay.

The following-named persons were employes of this office on June 30, 1880:

	Annual salary.
Theos. French, Auditor	\$5, 000
Southwick Guthrie, bookkeeper	2, 400

	Annual salary.
Aurin B. Nichols, railroad engineer	\$2,000
August Duddenhausen, assistant bookkeeper	2,000
Miss E. W. Rogers, clerk	1,400
Miss Katie Schmidt, copyist	720
Albert S. Seeley, copyist	720
C. M. Chapman, messenger	300

On this day, November 1, 1880, the *personnel* is as follows :

	Annual salary.
Theos. French, Auditor	\$5,000
August Duddenhausen, bookkeeper	2,400
Aurin B. Nichols, engineer	2,000
William M. Thompson, clerk	1,800
Miss E. W. Rogers, clerk	1,400
John B. Fay, clerk	1,200
Miss Katie Schmidt, copyist	720
Albert S. Seeley, copyist	720

Of the appropriations for this office for the fiscal year ending June 30, 1881, in all amounting to \$14,800, the following sums have been expended, viz : Salaries, \$12,293.56; traveling and incidental expenses, \$2,442.40; in all, amounting to \$14,735.96.

The appropriations for the office for the current fiscal year ending June 30, 1881, are as follows : " Salaries, office of the Auditor of Railroad Accounts: for Auditor, \$3,600; bookkeeper, \$2,400; assistant bookkeeper, \$2,000; railroad engineer, \$2,000; one clerk, \$1,400; one copyist, \$900; one messenger, \$600=\$12,900. Contingent expenses, office of the Auditor of Railroad Accounts: Traveling and other expenses, \$2,500; incidental expenses, \$300=\$2,800;" in all, amounting to \$15,700.

The estimates which have been submitted for the fiscal year ending June 30, 1882, are as follows: Salaries; for Auditor, \$5,000; bookkeeper, \$2,400; assistant-bookkeeper, \$2,000; railroad engineer, \$2,000; one clerk, \$1,600; one clerk, \$1,400; one copyist, \$900; and one messenger, \$600=\$15,900. Contingent expenses: Traveling and other expenses, \$2,500; incidental expenses, \$300=\$2,800; making, in all, \$18,700.

It affords me pleasure to acknowledge the ability, industry, and application with which my subordinates have performed their duties.

I have the honor to be, sir, very respectfully, your obedient servant,

THEOS. FRENCH,
Auditor.

The Hon. SECRETARY OF THE INTERIOR.

REPORT OF RAILROAD ENGINEER.

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DEPARTMENT OF THE INTERIOR,
Washington, D. C., November 1, 1880.

SIR: The following is a report of inspections of railroads included in the act of Congress approved June 19, 1878, establishing the office of Auditor of Railroad Accounts, made since the date of my last annual report:

During this period two inspection trips have been made.

The Baltimore and Ohio Railroad, having been adopted by act of Congress as a standard whose maximum grades and maximum degree of curvature shall not be exceeded by subsidized and land-grant roads, it was deemed desirable to make a trip over that road. The courtesy of the officers of the Baltimore and Ohio Company enabled this to be done under very favorable circumstances, and Mr. W. N. Bolling, civil engineer for the company, was detailed to accompany us. I desire to acknowledge his courtesy in giving information and pointing out items of interest.

The first trip of inspection was made in April, May, and June of this year, embracing a period of a little over two months. It included the above-mentioned examination of the Baltimore and Ohio Railroad, an inspection of the Saint Louis and San Francisco Railway and line leased by it from the Atlantic and Pacific Railroad Company in the Indian territory; the land grant portion of the Missouri, Kansas and Texas Railway; the Atchison, Topeka and Santa Fé Railroad; the Visalia division of the Central Pacific Railroad; that portion of the Southern Pacific Railroad that is leased to the Central Pacific Railroad Company, and its branches; the Southern Pacific Railroad Company of Arizona; the Pacific, and a portion of the Pend d'Oreille divisions of the Northern Pacific Railroad; the Oregon and California Railroad, and the Western Oregon Railroad, including the line of the Oregon Central Railroad which is operated under lease by the Western Oregon Company.

The second trip was made in August and September, and embraced a period of nearly six weeks. On this trip an inspection was made of the eastern divisions of the Northern Pacific Railroad; the Saint Paul and Duluth Railroad; the Sioux City and Pacific Railroad; the subsidized and land-grant portions of the Union Pacific Railway, and also its Utah and Northern and Summit County branches; the Central Branch Union Pacific Railroad, and the subsidized line of the Central Pacific Railroad. The inspection of the Central Branch Union Pacific was made by proxy, owing to my severe illness.

On these two journeys, in addition to the aforementioned, the following named land-grant roads were passed over in the regular trains, but no special inspection made, viz: The Cedar Rapids and Missouri River Railroad (leased to the Chicago and Northwestern Railway Company), the Chicago, Saint Paul and Minneapolis, and the Saint Paul and Sioux City Railroads (now forming a part of the Chicago, Saint Paul, Minneapolis and Omaha line); the Missouri Pacific Railway, main line, and the Southern Pacific Railroad, northern division. The following named unaided lines leased by subsidized or land-grant roads were also passed over, viz: The Pueblo and Arkansas Valley Railroad; the California Pacific Railroad, between Sacramento and Suisun; the Northern Railway, between Oakland and Suisun, and the San Pablo and Tulare Railroad.

As the Denver and Rio Grande Railway, and the Denver, South Park and Pacific Railroad are important factors in the transportation question in Colorado, an excursion was made over a portion of each of their lines.

The abundant crops of the past three years have largely increased the earnings of the railroads. The drought in Western Kansas and Nebraska has somewhat affected the business of the roads in that region, but generally speaking, the crops have been good, and the acreage greatly increased over former years.

A very noticeable feature on many western roads has been the more thorough and efficient condition in which the equipment, especially that pertaining to passenger traffic, has been maintained, as compared with the way and its appurtenances. It is gratifying to notice that the recent increase in prosperity has enabled many companies to expend considerable sums in improving the condition of their roadway and structures. This improvement consists not merely of renewals in kind, but also in the substitution of permanent structures for those of a temporary character, and of steel rails for those of iron. There is still room for much improvement, especially in the drainage and ballasting of road-bed, and the policing of line and yards.

As an indication of the rapidity with which this western country is being developed, it may be proper to state, that out of a total of about four thousand (4,000) miles of track, laid in the first nine months of the current year, over twenty-six hundred miles are west of the Mississippi River.

In my last report, the adoption of efficient bridge floors, provided with proper guard rails, so as to reduce the danger from derailed trains to a minimum, was especially urged for the roads reported on which were not already thus equipped. Before my report went to the press the accident at Saint Charles bridge over the Missouri River occurred. The coroner's jury in the case report that "the railway company or owners of the bridge are responsible for the fatal result of the disaster in allowing the floor timbers to remain in the bridge so long that they became deteriorated," and "we further consider that the floor system of the bridge in use at the time of the accident, while in accordance with approved practice at the time of its construction, was not altogether safe, and it lacked the necessary precautions against disaster resulting from derailed cars."

I find reports of thirteen different accidents which have occurred in the United States during the eighteen months ending June 30, 1880, from derailments on bridges, or from defects in the bridge superstructure, occasioning the loss of a number of lives, and the destruction of property of considerable value. There have been without doubt many others of like character, either not reported, or else classed under the head of accidents from "*unexplained causes*." The fall of the Tay bridge in Scotland December 28, 1879, with its attendant loss of life, calls to mind the disasters in this country at Ashtabula, Ohio, December 29, 1876, and at Tariffville, Conn., January 15, 1878. All of these three disasters were occasioned by defects in the structures themselves, either in design, or manufacture, or both.

It is not an uncommon practice in the United States for railroad companies to make contracts with manufacturers for bridges to be constructed from designs furnished by the latter. In many cases the designs are never examined; the material and workmanship are not inspected during the process of manufacture; nor is the structure examined for acceptance after erection by an expert on behalf of the railroad company; and in consequence, bridges are in use whose margins of safety are much less than is called for by the best practice. In some cases which have come to my knowledge the engineer has been overruled by superior authority in order to save in first cost, and bridges have been erected which have had to be removed in a short time on account of manifest weakness.

As relating to the practice of allowing manufacturers to design bridges without expert supervision, I quote the following extract from a letter from Mr. Clemens Herschel, member of the American Society of Civil Engineers, published in the Boston Daily Advertiser January 25, 1877, in which, after commenting on the Ashtabula failure, he says: "There is only one correct way of building bridges or large roofs: a constructing engineer must design the bridge or roof; his plans can be changed in detail until satisfactory to the party that pays for it, and all contractors must bid on that one plan." This, in my opinion, is the correct method, and if universally adopted, with the addition of proper inspection during manufacture and erection, would doubtless prevent numerous accidents from originally defective structures; nor would this practice work any injustice to competent engineers engaged in the manufacture of bridges, as it would effectually protect them from ignorant and unscrupulous competitors.

In connection with this subject of safety of railroad structures, I would mention the great need there is of more experimental information in regard to the behavior of American iron and steel under the various conditions of stress. The importance of tests of this character can scarcely be overrated.

Congress, at its last session, appropriated \$10,000 for the purpose of continuing such tests, and it is to be hoped that liberal appropriations will be made from time to time until they shall be completed.

After the occurrence of the Ashtabula disaster, the subject of governmental inspection of bridges and investigation of accidents was agitated, and communications on the subject from eminent civil engineers appeared in the public prints. Several bills have, at different times, been introduced in Congress on the subject of railroad accidents, but none passed. In Great Britain there is an inspection on behalf of the government by the railway inspectors of the Board of Trade, but the experience at the Tay bridge seems to indicate that the British system is not entirely efficient.

That something should be done to protect life and property from destruction, caused by improperly designed or badly made railroad structures, the numerous disasters of this character seem clearly to indicate.

Another subject which may at some future time be a proper one for the general government to take action on, is that of the uniformity of train signals. It is needless to do more than mention this, as the misunderstandings liable to result from the use of tracks in common, by several companies, on whose lines a given signal on one does not mean the same thing on all, are evident. Cases where such conditions exist are not unknown in this country. If action is to be taken on this matter by the States severally, a long line may find itself obliged by law to use two or more systems of signals, each differing from the other.

There are, doubtless, difficulties attending the establishment of an efficient system of national supervision under our form of government and in our vast territory, but it is believed that they will not be found insurmountable when the proper time for action arrives.

In the following report, the roads have not been taken up in the order in which they were inspected, but, as in my report of last year, they have been considered as far as practicable as follows, viz:

Roads that have been aided with bonds, lands, depot-grounds, right of way, &c., granted by the United States; roads that have been aided with lands, depot-grounds, right of way, &c., granted by the United States; and roads that have been aided with lands, depot-grounds, right of way, &c., granted by the United States to sundry States for that purpose.

UNION PACIFIC RAILWAY.

The Union Pacific Railway Company was formed January 26, 1880, by the consolidation of the "Union Pacific Railroad," the "Kansas Pacific Railway," and the "Denver Pacific Railway and Telegraph" Companies.

The property is operated in two grand divisions, viz, the Union Division, embracing the line from Council Bluffs to Ogden, and controlled branches; and the Kansas Division, embracing the line from Kansas City to Cheyenne, and controlled branches. Each grand division will be considered separately.

The road owned is:

	Miles
Council Bluffs to Junction with Central Pacific.....	1, 038. 45 ²
Kansas City (State line) to Denver.....	638. 6
Leavenworth to Junction.....	31. 9
Denver to Cheyenne.....	105. 89
Total owned	1, 814. 84 ⁵

The road controlled and operated June 30, 1880, was:

Omaha and Republican Valley.....	132
Omaha, Niobrara, and Black Hills	81
Colorado Central.....	184
St. Joseph and Western	252
Maryville and Blue Valley.....	38
Summit County.....	8
Utah and Northern.....	304
Carbondale Branch.....	32
Junction City and Fort Kearney.....	70
Solomon Railroad.....	57
Salina and Southwestern	36
Boulder Valley.....	27
Golden, Boulder, and Caribou	6
Total.....	1, 227

Of the line owned, 5 miles are leased to the Central Pacific Railroad Company, leaving the grand total owned and operated June 30, 1880, 3,036.848 miles.

UNION DIVISION.—MAIN LINE, COUNCIL BLUFFS TO OGDEN.

Inspection made in August, 1880.

During the year many improvements have been made, which will be noticed in practically the same order as the different items were reported on last year.

Alignment and grades.

The only change in location I have to notice is at the "Elkhorn Hill." The line between the crossing of the Elkhorn River and Omaha passes over the peninsula between the Platte and Missouri Rivers. As originally located and built, the line after crossing the Elkhorn ran at nearly right angles to the direction of the ridge, and reached a summit in a distance of 7,800 feet. From the Elkhorn Crossing for a distance of 1,000 feet there was a slightly descending grade, then 2,800 feet of level and 4,000 feet of ascending grade of 79 $\frac{2}{10}$ feet per mile, combined for a distance of 2,150 feet with a two-degree curve. The maximum grade against the east-bound traffic at any other point on the locomotive division embracing this piece of line is 39 $\frac{5}{10}$ feet per mile. This short grade of 79 $\frac{2}{10}$ feet per mile has always been a source of great annoyance and expense in operating the road.

The change now in progress, while lengthening the road but little, if at all, reduces the grade to a maximum of 21 feet per mile.

Graduation and masonry.

There is nothing special to observe in regard to the excavations. One or two shallow cuts have had their slopes flattened, to prevent the lodgment of snow. The low embankments on the Eastern Division, comprising a large portion of its length, are now of good width; the widening of embankments is in progress at a number of places on the

Mountain Division between North Platte and Cheyenne; and a force is engaged on similar work on the Western Division.

The tunnels are in the same condition as at the date of last report, viz, tunnel No. 1 is partially arched with old rails, No. 2 is timbered, and No. 3 and No. 4 are in solid rock. My remarks of last year in regard to bridge masonry will still apply, viz, "the masonry under iron bridges is good, much of it having been rebuilt; where old masonry has been retained it has been repaired." No changes have been made, so far as I am aware, in either boxed or arched culverts.

Road-bed and superstructures.

The road-bed is now of good width throughout nearly the whole length of the eastern division, while on the other divisions, the amount of narrow roadway has been decreased by the widening of embankments.

A much larger number of cuts are well ditched than at the date of my report last year, and improvement has been made in the general appearance of the roadway and track. The improvement in this respect is not, however, uniform over the whole line, but is seemingly more dependent on the roadmasters individually, than upon any regulation of the service. The adoption and enforcement of a uniform standard for the maintenance of road-bed and track would very much improve the appearance of the property, to say nothing of the efficiency of a roadway thus maintained.

The renewals of ties for the five years ending December 31, 1879, have averaged 17 per cent. per annum, and large numbers of new ties are being put in this season.

About one-sixth of the ties used are oak, renewals on the eastern division being made chiefly with ties of this wood.

At the close of the year 1879 there were 485 miles of track laid with steel rails. During the first nine months of the current year, 156 miles have been put down, making a total of 641 miles laid with steel. The weight of steel rail now used is 58 pounds per lineal yard.

The line and surface of track have been much improved on the eastern division, even where the old chair iron rails still remain in the track. On the other division, the track has been maintained in generally good condition, and as a whole, is better than it was a year ago. Some of the curves have been rectified, and minor undulations in the track worked out.

With the exception of those at Omaha and Sidney, the principal yards are in a neat and creditable condition. At Omaha passenger station, the neglect to remove rubbish and refuse thrown from trains, and to keep the passenger platforms swept, is particularly noticeable.

No ballasting has been done during the year, except at a few bad points on the Laramie division, and at some of the yards.

Quite a number of side tracks have been laid. The length now in use is $211\frac{7}{10}$ miles, or 17 miles more than at the date of my last report, and $11\frac{7}{10}$ miles more than was reported by the company December 31, 1879.

No change has been made as regards switches, signals, &c., the patterns used remaining the same as last year.

Some barbed-wire fence with iron posts has been put up, but the number of miles has not been reported.

The telegraph line is in good condition.

The company now have in use or in process of erection 18 iron bridges.

The pile and trestle bridges are generally in good repair, quite a large amount of work having been done in renewals and repairs this season.

No change has been made in the floor system on bridges. The floors are wide, the ties laid close and spiked to girders, but no guards are used.

Buildings.

Sheds with wrought-iron skeletons and corrugated iron coverings have been erected over the passenger platforms on the west side of the "Transfer Station" at Council Bluffs. Similar sheds should also be put up over the platforms on the east side. The waiting-rooms and ticket-office facilities at this station are too small for the large business done. Improved sanitary arrangements should also be made for this building. At the date of inspection, the stench from the cesspools was very offensive in the sleeping apartments, and particularly so in the dining room.

The new station building at Kearney has been put in use, the general repairs on the hotel at Laramie have been completed, and the station buildings at various points have been repaired.

No change has been made by this company in the arrangement of buildings and tracks at Ogden. A union depot large enough to accommodate the extensive business now centering at this point is much needed.

New frost-proof water tanks have been built at Millard, Central City, Alda, Elm Creek, Junction of Greeley Branch, Sidney, Antelope, and Rawlins. These tanks are supported by cast-iron columns, on stone or concrete foundations, and are put up in a substantial and workmanlike manner. The exit pipes should, I think, have been made 6 inches or 7 inches in diameter, instead of 4 inches.

The following additions to shop buildings and machinery have been made, viz: At Grand Island, a rail cutting and punching machine with frame building covering it; at Laramie, new store-houses at the shops and rolling-mill, new spike, bolt, and splice-bar machinery at the latter; and at Evanston, a new boiler shop and some new machinery.

New coal chutes have been put up at Plum Creek.

Snow-sheds remain without change, and snow-fences are in good condition.

The rolling-stock has been well kept and some additions made.

The company has also extended its coal-mining operations during the year.

A branch line from a point near Julesburg to Greeley, Colorado, is in process of construction, and extensions have been made to several of the controlled lines.

Of these controlled lines only the Summit County Railroad and the Utah and Northern Railway have been examined this year.

Summit County branch.

This road was a narrow-gauge line from Echo to Coalville, Utah Territory, where the railroad company has large coal mines. It has been changed to a standard gauge road, and is in process of extension to Park City, Utah, where are located the Ontario silver mines. It is the intention of the company to complete this line during the present season.

At the time of my visit, August 23, 1880, the track was laid for about 9 miles from Echo; the whole distance to Park City being about 23 miles.

Utah and Northern Railway.

This is a narrow-gauge (3 feet 0 inches) road, extending at the time of my trip over it, September 3 and 4, 1880, from Ogden, Utah Territory,

to Ryan's Cañon, 35 miles beyond Red Rock, Montana Territory, a distance of 339 miles. Since that time it has been extended farther, and is still in progress. It passes through the fertile and well-settled Cache Valley, in Utah, crosses the Bear River, and enters Idaho at Franklin (80 miles); passes over the divide into the Snake River Valley, crosses the Fort Hall Indian Reservation, and reaches the Snake River at Eagle Rock, 207 miles from Ogden. It crosses the river at this point on a wrought-iron "Pratt" truss bridge, of two spans, and follows up the right bank of the river to Market Lake (223 miles), crosses the lava plain to Camas (244 miles), thence ascends the valley of a small stream, passes through Beaver Cañon, reaches waters tributary to the Missouri River, and passes down Red Rock Creek and Beaver Head River to Ryan's Cañon, 339 miles from Ogden, and beyond.

Above Franklin the country is sparsely settled, but it is quite extensively used for grazing.

The road is the outlet for numerous mining camps, and for the whole of Southern Montana, and is doing a large and remunerative business.

It has sharp curves and steep grades.

The rail is 36 pounds per yard, iron, and is laid with plain double-fish joints. The rail is entirely too light for the traffic, the joints are weak, there is no ballast, and consequently the road is very rough, necessitating the movement of trains at very low rates of speed.

A heavier rail should have been used, or, what would have been better, the road should have been made of the standard gauge with 56-pound rail.

The facility of interchange of business with the main line, together with the advantages arising from the better utilization of rolling-stock with a uniform gauge on all parts of the system, and the larger capacity of the standard-gauge road, would doubtless much more than compensate for its slightly greater first cost.

The road-bed is in as good condition as can be expected, considering the short time that has elapsed since the track was laid.

The buildings are nearly all of a temporary character.

The greater portion of the rolling-stock is new, or nearly so, and is consequently in pretty good condition.

Neither safety-couplings nor power-brakes are used.

KANSAS DIVISION.—CHEYENNE TO KANSAS CITY.



Inspection made in September, 1880.

The improvement on this division is chiefly in new buildings and the water-supply.

So far as the permanent way is concerned, much of it is in worse condition than at the date of last report, while no special improvement has been noticed anywhere, except on the Cheyenne division.

On the Denver division, Denver to Wallace (219 miles), it has been very difficult to secure laborers, and almost impossible to retain them at the wages paid by the company, and in consequence of insufficient forces the maintenance of way has been neglected.

This has also been the case, though to less extent, on the Smoky Hill division, Wallace to Brookville (220 miles). The drought having spoiled the crops, the settlers have been obliged to work on the railroad to maintain themselves, relieving to a certain extent the scarcity of labor on this division.

In addition to the above-mentioned cause, both the Denver and Smoky Hill divisions have been visited during the summer by a succession of

"cloud-bursts," occasioning numerous wash-outs, and keeping the limited force almost constantly employed.

The remedy for insufficient forces would seem to be, to raise wages enough to attract and retain labor. It is possible, that if the company would make some efficient provision whereby workmen could be comfortably housed and fed at moderate rates in the unsettled region through which the Denver division passes, it might assist in solving this "labor problem"; and perhaps enable them to retain workmen without paying exorbitant rates.

Alignment and grades.

The report of the company to this office December 31, 1879, states that the maximum grade ascending westward is 76 feet per mile, ascending eastward 94 feet per mile, and sharpest curve ten (10) degrees.

These figures differ from those given in my last report, and are doubtless correct. My figures last year were obtained from data on file in the department. The line was probably constructed with some changes from the data filed, which will account for the discrepancy.

There has been a change of line, and a reduction of grades near Alum Creek, made, I believe, during the last year.

Graduation and masonry.

A large amount of earth-work has been done in Denver yard, to provide for the rearrangement and extension of tracks and the new buildings.

Very little, if any, widening of embankments has been done, and no new bridge masonry has been reported.

Road-bed and superstructure.

On the Denver and Smoky Hill divisions, many of the embankments are narrow, and the cuts should be cleared of debris.

On the Kaw Valley division the road-bed is better kept, but no improvement over last year noted. Very little, if any, new ballast has been put in.

There were 119 miles of track laid with steel rails, on December 31, 1879, since which time about 62½ miles have been put down, making a total of about 182 miles. There have also been put down during the current year nearly 37 miles of rerolled iron between Denver and Kansas City, besides some on the Cheyenne division. Large renewals of ties have been made on the Cheyenne division, and renewals are in progress at various points elsewhere.

The track on the Cheyenne division has been much improved in line and surface; on the Denver and Smoky Hill division it has deteriorated in these particulars; while on the Kaw Valley division it has been maintained in about the same condition as it was when inspected last year. As regards switches and signals, there is no change to note. Mile posts have been set up on the Kaw Valley division.

The snow fences need extensive repairs.

The telegraph line is in good condition. Three iron bridges have been erected since December 31, 1879, making the number now in use ten.

The floor has been renewed, some new girders put in, and all of the girders covered with galvanized iron at the bridge over the South Platte on the Cheyenne division.

On the other divisions much work has been done repairing and renew-

ing pile and trestle bridges, and several new openings have been made in consequence of "wash-outs."

Buildings.

The following new structures have been put up on the Cheyenne division, viz: new windmills at Carr, Pierce and Evans, and a stone pump-house, with steam-pump, at Brighton (formerly Hughes). The tank at Evans has been painted. Elsewhere, the following have been noted, viz: at Denver, in connection with the remodeling of the yard, a new stone freight station, with platforms and transfer sheds, large enough to accommodate all the business centering there; a new standard frost-proof tank (with wrought-iron supports on stone foundations); and a coal chute with 28 pockets and storehouse for coal attached, have been built. A stone engine-house, with stalls for 28 engines, is under way, and a commodious union depot, in which the Union Pacific Railway Company has a large interest, will be ready for occupancy in a short time. These structures are all permanent and creditable improvements, and are apparently of sufficient capacity to accommodate traffic for several years to come.

Frame freight-houses have been put up at Box Elder, Hugo, and Buffalo; new standard tanks at Bennett's, River Bend, Arroya, Cheyenne Wells, Cleveland, near Wakeeny, Victoria, Black Wolf, Ellsworth, Salina, and Bismarck; new windmills at tank near Wakeeny and at Salina; new pump-houses at Monument, Cleveland, Victoria, Black Wolf, and Bismarck; new steam-pump at Bismarck; a new combination station at Collyer, and a passenger station at Armstrong; a frame dwelling and a handsome and convenient stone building for superintendent's office at Wallace; new coal chutes at Hugo, Cheyenne Wells, Ellsworth, Brookville, and Wamego, with 4 pockets each at Hugo and Cheyenne Wells, and 12, 24, and 28 at the others, respectively, and new wrought iron turn-tables at Hugo and Ellis. Twelve new tool-houses have been built on the Denver division, and the hotel at Ellis and the engine-house at Manhattan repaired.

Extensions have been made at the Armstrong shops, as follows, viz: additions to boiler, machine, erecting, smith, car, and tin shops, and new oil-house and office.

Water supply.

New wells have been dug at Evans and Pierce, on the Cheyenne division, and at Hugo, Sheridan, Monument, and Cleveland.

Equipment.

During the year 1879, 11 locomotives and 381 cars, of all kinds, were added to the equipment. The "motive power" does not appear to be in as good condition as it was at the time of former inspection, but the other rolling-stock shows no deterioration.

Since my last report 96 miles of extensions have been made to the various controlled lines connected with this grand division.

CENTRAL PACIFIC RAILROAD.

SUBSIDIZED LINE, SAN JOSÉ to OGDEN.

Inspection made in August and September, 1880.

On June 30, 1880, this company owned (main line and branches) as follows, viz:

	Miles.
Junction with Union Pacific to San Francisco.....	872.59
San José Branch.....	17.54
Oregon Division.....	151.60
Visalia Division.....	146.08
Oakland to East Oakland.....	5.67
Oakland to Mastick.....	3.82
Alameda Wharf to Melrose.....	5.19
Fruit Vale Connection.....	2.01
	<hr/> 1,204.50

And leased:

Union Pacific.....	5.00
Southern Pacific.....	550.20
Western Development Company.....	.13
Southern Pacific of Arizona.....	293.93
Los Angeles and San Diego.....	27.60
Los Angeles and Independence.....	16.83
Sacramento and Placerville.....	5.64
Stockton and Copperopolis.....	49.00
Amador Branch.....	27.20
Berkeley Branch.....	3.84
Northern Railway.....	112.60
San Pablo and Tulare.....	46.52
California Pacific.....	113.44

1,251.93

Total operated..... 2,456.43

Side tracks on lines owned, June 30, 1880.....	199.14
Side tracks on lines leased, June 30, 1880.....	99.00

Total side tracks..... 298.14

Since the above-mentioned date the Southern Pacific of Arizona has been extended upwards of 90 miles. The new line from Sacramento to San Francisco, via Benicia, went into operation December 28, 1879, and since that date the through traffic between those points has taken that route.

Alignment and grades.

No changes of line or improvement in grades have been made since the date of my last report. There are, however, a number of points between Sacramento and Ogden where a revision of the location would result in a large decrease in operating expenses.

Graduation and masonry.

The Secret-town embankment has been raised. At a few remaining points embankments need to be widened, and some of the cuts are still narrow, but much the larger portion of the road-bed is now of good width. So far as I am informed no masonry has been built during the

year. There are a good many small girder bridges, the masonry of which is in a shaky condition, and should be rebuilt.

As noted in my former report masonry abutments should be constructed at the larger bridges on the mountain, and the temporary trestle approaches done away with. No work, other than for maintenance, has been done at the tunnels.

Road bed and superstructure.

With the exceptions noted under "Graduation and masonry," the road-bed is of good width, and both it and the track have been well maintained. The road-way is gradually being brought up to a uniform standard, old material along the line is promptly gathered up and removed, and the yards and station-grounds kept in a neat and orderly condition. It is, perhaps, not too much to say, that the "track department" of this company's service is the best organized and most efficient of any that have come under my notice west of the Mississippi River, and compares favorably with any in the country.

The supply of steel rails for renewals has not been as great as the deterioration of the old iron, and should be increased in the future. The number of miles of steel track laid on the whole 1,204½ miles of road owned, during the year ending June 30, 1880, was 90, making the total steel track to that date 462.4 miles.

At the same date a total of five hundred and seventy-six (576) miles had been ballasted, and since that time a small amount of ballasting has been done.

At Ogden, the yard of this company has been remodeled in connection with the new buildings erected there. Quite a number of "Lorenz" safety switches have been put in.

On no portion of the company's system has the custom been introduced of lighting switches for night trains. I mention this subject, not as being peculiar to this road, but in order to call attention to the special importance of both day and night signals at switches on that portion of the line between Sacramento and Truckee, particularly in the snow-galleries.

There are points where the switch-stands are entirely obscured by the sheds until the observer is within a few feet of them, so that the targets are invisible and useless, even in the day time. At such points efficient distant signals should be introduced, so that in case of misplacement of the switch ample time would be had in which to stop trains.

When it is remembered, that during the season of snow, it is practically night all of the time in the nearly 40 miles of snow-galleries, and the heavy grades and sharp curves are taken into account, the importance of having efficient signals at all switches day and night will, I think, be appreciated. On the whole twelve hundred and four and one-half (1,204½) miles owned, the company had June 30, 1880, 708.8 miles of fencing, an increase during the year of two and one-tenth ($2\frac{1}{10}$) miles. I am unable to state what portion of this is on the subsidized line.

The telegraph line is in good condition.

Bridge work, during the year, has been confined to ordinary repairs.

The "section" of girders for small spans should be increased as renewals are made, and truss bridges calculated for heavier loads as they are rebuilt. The almost universal tendency of railway practice is now toward the use of heavier locomotives, and heavier loading of cars in freight service. The economy of such a course having been amply de-

monstrated, this company must eventually adopt this practice, and should therefore design its bridges accordingly. The floor system in general use on this line is very faulty. The ties are sufficiently far apart to allow a wheel to drop between them; there is no efficient provision for the prevention of "bunching" of ties; the ties (except on deck-trusses) are short; nor (except in a few instances) is there a guard of any kind to prevent a de-railed truck from leaving the bridge.

Buildings, &c.

New section-houses have been erected at Milpitas and Stockton; an extensive freight-house at Sacramento; a wood-shed at Bronco, and a combination passenger and freight station and dwelling at Deeth. New tanks have been put up at Golconda, Toano, and Be-o-wa-we, and one is to be built at Peko this fall.

The passenger station at Sacramento—mentioned in my report last year—has been completed, and has been occupied since December 28, 1879.

A cast iron turn-table at Stockton, and a wooden one at Junction, have replaced old structures. At Sacramento shops a rolling mill building was under way at the time of inspection. It is the intention of the company to roll all sizes of iron that are required in the service.

The very heavy snows of last winter caused the destruction of the snow-galleries in quite a number of places. They are being rebuilt on substantially the same plan as the old ones.

The snow fences are in good condition.

The rolling-stock and machinery have been well maintained.

Branches, &c.

VISALIA DIVISION.

This division was inspected May 11, 1880. The track, switches, bridges, &c., are of same pattern as those on the main line.

Large renewals of iron are needed, and very little of the line is ballasted. Making allowances for these facts, the line is in very fair condition.

Improvement at Oakland.

The improvement at Oakland is still in progress. When finished "this will consist of a solid embankment or mole constructed on and near the line of the present Oakland wharf, extending a distance of 6,650 feet from the Oakland shore, and of sufficient width for four railroad tracks and a carriage-way for a distance of 5,400 feet, and thence to the end, increasing to a width of 280 feet."*

LEASED LINES.

NEW ROUTE VIA NORTHERN RAILWAY AND CALIFORNIA PACIFIC RAILROAD TO SACRAMENTO.

This route was opened to the public December 28, 1879.

The Northern Railway, between Oakland and Port Costa (formerly Carquinez), is in excellent condition.

The ferry-boat Solano, built for the transfer of trains between Port Costa and Benicia, is working very successfully. She is a side-wheel

* Extract from Annual Report of Mr. S. S. Montague, Chief Engineer.

double-ender, 424 feet over all; 406 feet on bottom; extreme width over guards, 116 feet; draught, light, 5 feet, and loaded $6\frac{1}{2}$ feet. Registered tonnage is 354.31 tons. Engines are two in number; they are vertical beam engines, with cylinders 60 inches bore, and 11 feet stroke. "Wheels 30 feet diameter, with 24 buckets each, 17 feet face. Boilers are tubular, 8 in number, each 7 feet diameter of shell, and 28 feet long, with 143 tubes 4 inches diameter and 16 feet long. Total heating surface in all the boilers, 19,640 square feet; grate surface, 288 square feet. Each wheel is driven by an independent engine." There are four balanced rudders at each end of boat, $11\frac{1}{2}$ feet long by $5\frac{1}{2}$ feet deep, coupled together and worked by hydraulic steering gear.* There are four railroad tracks, each running the whole length of the deck, affording "capacity for 48 freight cars, with locomotive, or 24 passenger coaches of the largest class." "The aprons connecting the boat with the slips * * * are each 100 feet long, with four tracks, so arranged that freight and passenger trains are run aboard without being non-coupled from the locomotive. The aprons weigh each 150 tons, and are worked by a combination of pontoons and counter-weights by hydraulic power."

The distance across the straits, from slip to slip, is $1\frac{0.3}{100}$ miles, and the transfer of a passenger train, under ordinary circumstances, requires about 13 minutes from the time the train stops on one side of the straits until it leaves the boat on the other. The steering gear is very efficient, the pilot guiding the boat easily with one hand, although the current is sometimes at the rate of 7 miles per hour.

The new portion of the line between Benicia and Suisun has been brought up to a good condition, with the exception of the sinks in the "tule" land. On the California Pacific, between Suisun and Sacramento, a large amount of ballasting has been done, and some steel rail put down.

SAN PABLO AND TULARE RAILROAD.

This line has been maintained in good condition, except in some places where it runs over "tule" land.

SOUTHERN PACIFIC RAILROAD.

Inspection made May, 1880.

The line leased by the Central Pacific Company extends from Huron, Cal., to the Colorado River at Fort Yuma.

The maximum grade is $116\frac{1.0}{100}$ feet per mile, and the sharpest curve is 10 degrees.

Weight of iron rail per lineal yard, 56 pounds; weight of steel rail per lineal yard, 50 pounds.

There is a land grant for the whole length of the main line from Huron to the Colorado River, but a very small proportion of it is of value.

The road and equipment are in very good condition, being maintained on the same plan and under the same general supervision as the owned lines of the Central Pacific Company. On December 31, 1879, there were 340 miles of track laid with steel rails, and a portion of the line ballasted with gravel.

The tunnels are twenty in number, of an aggregate length of 15,247 feet, all lined with timber.

* Patented by Mr. Jno. Gates, Mechanical Engineer of the Oregon Railway and Navigation Company, Portland, Oregon.

The bridges are nearly all pile and trestle, and are similar in detail to those on the Central Pacific main line.

The station buildings are in good repair.

The water-supply on the Yuma division is deficient, no water having been found between Walters and the Colorado River, a distance of 106 miles, although borings have been made to a great depth, 1,350 feet having been reached in one place.

There are shops sufficient for the present demands of the road at Los Angeles, and engine-houses at Mojave and Sumner.

The branches from Los Angeles to Santa Monica, Wilmington, and Santa Ana, are in good condition. The local business on all of these lines is light.

SOUTHERN PACIFIC OF ARIZONA.

This line has received no aid from the United States, and is only mentioned here because it forms a part of the Central Pacific system of roads. The line is in as good condition as can be expected of a road so recently built.

Lying, as it does, in a country almost entirely desert, its business is chiefly with the numerous mining districts, and in supplying the northern provinces of Mexico.

The recent development of mining interests in Arizona has made a profitable business for the railroad, which it is hoped will be permanent, and when connection is made with roads leading east, some through traffic will doubtless be obtained.

CENTRAL BRANCH UNION PACIFIC RAILROAD.

This company owns the subsidized line from Atchison to Waterville, Kan., 100 miles, and leases the lines of the Atchison, Colorado and Pacific Railway Company, 261 miles, making a total owned and operated of 361 miles; and the whole is operated as a part of the Missouri Pacific system, the accounts, however, being kept separate.

SUBSIDIZED LINE.

Inspection made September, 1880.

On this road the following improvements have been made, or are in progress, viz:

The grade has been cut down near Effingham, and also near Farmington, and embankments widened near Effingham and Netawaka; a new arched culvert of 8-foot span has been put in, in place of a bridge, and the masonry for six girder bridges rebuilt; sixteen miles of track ballasted with stone, and 50,000 ties and 15 miles of iron provided for renewals and repairs for the current season.

New side tracks have been put in at Effingham, Netawaka, and Bigelow.

One pile bridge has been wholly rebuilt, and four partially; four pile openings added; nineteen girder bridges and the approach to bridge No. 101 renewed; one "Howe" truss substituted for a girder bridge; the woodwork of two "Howe" bridges renewed, and one new overhead bridge for wagon road constructed.

At Atchison a new store-house and an office for master mechanic; at Corning a new coal platform and chutes; and at Brighton the foundations for a new station have been built; the station at Farmington painted, and the passenger platforms at several stations renewed.

A union depot, in which this company is interested, has been erected at Atchison, with sufficient capacity to accommodate the passenger business of all the roads centering there.

SIoux CITY AND PACIFIC RAILROAD.

This company now owns and operates railroad as follows, viz :

<i>Owned.</i>		Miles.
Sioux City, Iowa, to Missouri Valley, Iowa, and Fremont, Nebraska.....		107.42
<i>Leased.</i>		
Fremont, Elkhorn, and Missouri Valley.....		109.99
Total owned and operated.....		<u>217.41</u>

Inspection made in August, 1880, but did not include any leased line. On the line owned, the condition of the track has, on the whole, been improved.

Renewals of ties have been made and some rerolled iron laid.

Repairs and renewals of trestle and pile bridges have been continued, and the only "Howe" truss on the line renewed.

A new frost-proof tank and a windmill have been erected at Sloan, and four new engines and some new freight and stock cars added to the equipment.

The crossing of the Missouri River by ferry still continues to be a serious drawback to the operations of the road.

It is probable that at no point on the Missouri, where a railroad transfer has been made, has the river been more troublesome than at this place. Notwithstanding this, and the considerable expense attending it, this company has been able during the year, to improve the condition of its road and increase its rolling stock.

Considering the peculiar situation of this line, and the difficulties encountered in operating it, the management deserve great credit.

NORTHERN PACIFIC RAILROAD.

Inspection of Pacific and Pend d'Oreille divisions made in May, 1880, and of the eastern divisions in August, 1880.

On June 30, 1880, this company had in operation railroad as follows, viz :

<i>Road owned.</i>		Miles.
One-half interest in road from Duluth to Northern Pacific Junction.....		24.0
Northern Pacific Junction, Minnesota, to Curlew, Dakota Territory.....		484.5
Kalama to Tacoma, Washington Territory.....		105.0
Payallup Branch, Washington Territory.....		31.6
		<u>645.1</u>
<i>Road leased.</i>		
Joint use of track from Saint Paul to Sauk Rapids, Minnesota.....		75.5
Sauk Rapids to Brainerd, Minnesota.....		60.5
		<u>136.0</u>
Total owned and operated.....		<u>781.1</u>

On the same date the track was finished, on the Missouri division, to a point about 41 miles west of Curlew; and on the Pend d'Oreille division, about 18 miles were laid from Ainsworth east.

On August 16, 1880, the one hundred miles of road from the Missouri River west was accepted by the President of the United States, and has since been put in operation throughout the whole distance. The company also own the Casselton Branch Railroad, now in operation from Casselton, Dakota Territory, to Elm River, 31 miles, and under way for $11\frac{1}{2}$ miles beyond that point.

PEND D'OREILLE DIVISION.

A portion of this division was visited on May 22-24, 1880. At that time the track was laid from Ainsworth east about 18 miles.

At the end of track wagons were taken, and the trip extended to a point about 83 miles from Ainsworth.

With the exception of one heavy cut, the graduation was nearly done to about 75 miles from Ainsworth, while beyond that point work had been commenced. Except at the "Summit" cut, the work is light, with but little rock. For the first 25 miles there is no bridging, and but little beyond.

The work so far as completed has been well done.

The material (rock excepted) is either fine sand or volcanic ash. The embankments composed of these will probably be difficult to maintain when the line is exposed to high winds, and it is quite likely that the track will sink in the volcanic ash banks, unless ballast is put in.

There being no timber in this section, great delay has been experienced in getting cross-ties and lumber, and, in consequence, track-laying has progressed very slowly.

Since the date of inspection the grading has been completed to Spokane Falls, 150 miles from Ainsworth, and the track extended to 25 miles from Ainsworth. Grading has also been done on a line to connect the road at Ainsworth with the Oregon Railway and Navigation Company's line at Wallula, a distance of about 12 miles.

PACIFIC DIVISION.

Inspection made May 26, 1880. The Pacific division comprises the line from Kalama, on the Columbia River, to New Tacoma, Washington Territory, on Puget Sound, 105 miles, and a branch to Wilkeson, 31.6 miles.

The business is very light, and requires close management to make earnings meet expenses.

The line after leaving the Columbia River passes up the Cowlitz River for nearly thirty miles, and thence strikes across the country to Puget Sound, crossing on its way Newaukum Creek, and Skookum Chuck, Des Chuttes, and Nisqually Rivers.

The maximum grade is 116 feet per mile, but occurs only for a short distance at Tacoma, the maximum, with this exception, being 52.8 feet per mile.

The sharpest curve is 10 degrees. The location of the line is faulty in some respects, there being quite a number of places between Tenino and Tacoma where sharp curves are reversed with no tangent between them, and some between Kalama and Tenino with but very short tangents.

Quite a number of the embankments are narrow, and a good many of the cuts need ditching.

There is no bridge masonry, nor are there any tunnels, on the line. A good portion, probably more than 50 per cent., is fairly ballasted with gravel. The ties are of pine. Rails are laid with plain double-fish splice, with joint opposite.

From Kalama to Tenino, 66 miles, the track is not in good surface, but it is much better between Tenino and Tacoma.

Throughout nearly the whole distance the track needs lining up and the curves rectifying and adjusting.

There are quite a number of "Howe" truss bridges (some covered), and numerous pile and trestle bridges. Bridge floors are without guards.

There are good station buildings at Kalama and Tenino, and temporary ones at Cowlitz, Olequa, Winlock, Napavine, Centreville, Yelm Prairie, and Lake View. At Tacoma the company have frame shops, warehouse, office, and hotel building, and extensive wharves for shipping coal.

The rolling stock is not in first-class condition. Neither power-brakes nor safety-platforms are used on the passenger equipment.

The Puyallup branch is in very fair condition. Its eastern terminus is now at Wilkeson, where the company have coal mines.

MINNESOTA AND DAKOTA DIVISIONS.

Inspection made in August, 1880. These divisions embrace the road from Duluth, Minnesota, to Bismarck, Dakota Territory, a distance of 450 miles. From Duluth to North Pacific Junction, 24 miles, this company has an undivided one-half interest in the road, the Saint Paul and Duluth Company owning the other half. For a report on this portion see Saint Paul and Duluth Railroad, page —.

The line from North Pacific Junction to Fargo is very straight, a large portion of it being tangent, and passes over a gently undulating country.

The maximum grade is 50.2 feet per mile on the Minnesota, and 60.2 feet per mile on the Dakota division; and the sharpest curve is 3 degrees on each. In two places reversions occur with very short tangents between, which are entirely unnecessary in so flat a country.

The grades are adjusted so as to follow the undulations of the ground very closely.

Many of the embankments are narrow, some of them need raising, and many of the cuts require ditching. There are no tunnels. About 140 miles are wholly or partially ballasted with gravel. The ties are nearly all of soft wood; rail is 56 pounds per yard, laid with double, plain, fish-joint.

During the fiscal year ending June 30, 1880, 116,000 ties, mostly oak, and 128 miles of steel were put in the track, and 26,000 feet of new siding laid. "Stub" switches are used, with revolving switch-stands with targets. Most of the frogs used are of the "Mansfield" pattern.

On the Minnesota division the track is in fair line and surface, although some of the curves should be rectified. On a considerable portion of the Dakota division the track is out of line and surface, and large renewals of ties needed.

The appearance of the line would be much improved if old material was thoroughly gathered up and removed, and bushes, &c. cut down near the track.

There is a "Post" combination bridge over the Mississippi River at Brainerd, and there are about fifteen spans of "Howe" truss bridge, and numerous pile and trestle bridges at various points. The truss bridges are all supported on timber piers. During the year ending June 30, 1880, 33 pile bridges were renewed and 88 culverts repaired.

The station buildings are nearly all neatly painted and well maintained wooden structures, and do credit to the company.

The water-service seems to be efficient and the buildings and machinery well maintained. Two frost-proof tanks have been put up during the fiscal year.

At Duluth the company have a brick engine-house, with stalls for 10 locomotives, and during the fiscal year they have extended their facilities at that point by the addition of 700 feet of dock and the construction of 6,006 feet of track supported on piles.

At Brainerd are situated the company's principal shops, consisting of engine-house, with 12 stalls, car-house, machine and smith shops, foundry, and store-house, and office; all of them frame. The shops are furnished with good machinery, but appear to be too small for the present wants of the road, and there is a conspicuous lack of order and neatness about them. There are also at Brainerd, belonging to the company, a very large and convenient office building, a hotel, a freight-house, and a "colonists' reception house," all of them frame, besides the necessary smaller buildings incident to a division point.

At Fargo there have been built during the fiscal year a brick engine-house with stalls for 12 locomotives, a brick shop 85 feet by 40 feet, and a brick freight-house 150 feet by 40 feet; all of them with slate roofs.

At Bismarck there is a frame engine-house with 6 stalls, and frame passenger and freight houses. The line is supplied with good-sized and well-maintained two-story section houses and plain board tool-houses.

During the last winter great trouble was had on account of snow blockades.

The snow-fences are generally in single ranks, and are composed of posts set in the ground, with rails and upright batten.

That blockades should occur with the limited provision for their prevention is not surprising. To avoid trouble in the future it may be necessary, in some cases, to either raise the road-bed up out of shallow cuts or to grade the sides of such cuts down to a very flat slope, as may be found most desirable. Buildings should be so located, and materials piled, as to throw the drifts occasioned by them away from the track; snow-fences placed in double, triple, or quadruple ranks, as may be found necessary, and constructed on the plan now in general use on other roads, so as to be easily moved when circumstances require it, or raised up when filled with snow. In long and deep cuts snow-sheds may be necessary. These, in conjunction with an efficient equipment of snow-plows and track-flangers, should enable the company to operate the line in winter without serious delay.

The rolling stock is in good condition. The passenger equipment is supplied with "Miller" platforms and "Westinghouse" automatic brakes.

The equipment has been increased during the fiscal year by the addition of 9 locomotives, 8 caboose-cars, 1 pile-driver, 200 box and flat cars, 1 observation-car, 37 hand-cars, 4 baggage-cars, 5 snow-plows, 30 push-cars, 15 boarding-cars, 3 snow-flangers.

MISSOURI DIVISION.

The crossing of the Missouri River is effected by means of a transfer-boat capable of carrying 6 freight-cars at one time.

The same difficulties, arising from the unstable character of the river, that have been encountered at other transfers on the Missouri, have been experienced here.

Plans and estimates have been prepared for a high-level bridge at this point, consisting of 3 spans of 400 feet each, and 2 of 100 feet each, with the necessary earthwork approaches, and a dike above the bridge to narrow the river (which is here about 2,700 feet wide) to a width of 1,200 feet, the cost of which, it is estimated, will be about \$800,000, using masonry piers, abutments, and wrought-iron superstructure.

The 100 miles extending from the Missouri River westward, recently accepted by the President of the United States, is in very fair condition for a road newly opened through an almost uninhabited country.

On this piece of road the maximum grade is 51.06 feet per mile; the sharpest curve 5 degrees, and 76 per cent. of the distance is tangent.

The line is laid with 56-pound iron, with plain, double fish-joints, on ties chiefly of soft wood, and with no ballast.

The switches are of the same pattern as on other portions of the road.

The sidings aggregate 22,950 feet, not including 17,800 feet of track at the lower "transfer," on the west bank on the Missouri River.

There are 6 spans of combination "Pratt" truss of an aggregate length of 990 feet, supported on cut work piers filled with stone.

These bridges are built of apparently good material and workmanship, but the factor of safety is not as large as it should be.

The pile bridges are one hundred and forty-two in number, and generally well built. Nearly all of the bridge floors are furnished with timber-guards, and where temporary floors still remain they are being replaced with new ones.

There are at Mandan a frame engine-house with 4 stalls; a coal-shed; a passenger and freight station combined; a superintendent's office, and a dwelling for superintendent; besides stable, store, tool, and tank houses, and temporary carpenter's shop; all of them frame.

There are 4 frost-proof tanks at other points, and 4 standard section-houses.

LEASED LINES, ETC.

The line from Brainerd to Sauk Rapids, Minnesota, leased from the Western Railroad Company, of Minnesota, is a road maintained in good line and surface, with well-shaped road-bed without ballast.

Bridges are "Howe" truss and pile, and, as the road has been operated but about three years, are nearly new.

The station buildings are in good condition.

Water-tanks are of the frost-proof pattern.

The line from Sauk Rapids to Saint Paul, used jointly with the Saint Paul, Minneapolis and Manitoba Railway Company, is also in commendable condition for a road maintained without ballast, the neatness and order in connection with everything visible along the line being especially noticeable.

Improvements at Saint Paul.

At Saint Paul the filling up of the ground acquired for terminal purposes is in progress, and a freight-house 400 feet by 40 feet has been erected.

The construction of a building to be used for the general operating offices of the company has also been commenced.

Lands.

The following remarks on the lands of the company are submitted here, not as a report on all of the territory embraced in the grant to the company, but as notes on the portions passed through on the several trips of the present season.

From the commencement of the company's grant at the western edge of the grant to the Saint Paul and Duluth Railroad Company to about 40 miles west of Brainerd the country is a succession of swamps and low uplands, interspersed with numerous lakes. The swamps are mostly covered with a growth of tamarack, cedar, and spruce, while on the uplands are found white pine, oak, some elm, and various other kinds of wood usual in a forest in the northern United States.

From about 40 miles west of Brainerd to about 35 miles east of Fargo the country is prairie, with numerous lakes, patches of swamp, and occasional timber, and much of it good for agricultural purposes. From this latter point westward to the Missouri River stretches the great wheat region, embracing the celebrated valley of the Red River of the North.

This country is rapidly filling up with settlers, apparently of a good class, the neat, well-painted farm buildings so noticeable in this region, bearing witness thereto.

West of the Missouri River, on the portion of road recently accepted by the government and opened for use, the country is as yet almost uninhabited, and but little of the land surveyed. This region is all open "plain" country, somewhat more broken and undulating than that between the Red and Missouri Rivers, but the greater portion of it is apparently good wheat land, and will, doubtless, produce good crops, though not, perhaps, so large as in the Red River Valley. Extensive beds of lignite are found on this portion of the road, and extend much farther west, furnishing a fuel available for all domestic purposes. The company are now using this fuel in their locomotives, mixed in equal quantities with other coal.

It is probable that with a modified form of fire-box, similar to that now being introduced on some eastern roads, this fuel can be used without admixture with any other. Lignite of no better quality than this was burned successfully in the American engine with "Wooten's" fire-box, which was sent to the late Paris exposition, during some trials on the Italian railroads.

I am informed that steps have been taken to test this fuel in a similar manner.

On the Pacific division the line from Kalama to Tacoma passes through a well-watered, timbered country, with occasional open prairies. These prairies do not appear to be very rich, but there are, doubtless, lands in the river bottoms good for farming purposes.

The magnificent timber embraced in the company's grant on this coast must become valuable as soon as communication is opened with the treeless district east of the mountains. At present, as shipments are chiefly made by sea, only those lands bordering on the sound are available.

The large beds of cretaceous coal lying within the grant must also prove valuable. During the late inspection, the mines at Wilkeson were visited. Owing to an improper system of mining these mines have not hitherto been successful. The coal lies in large veins, with a dip of about 65 degrees, with the ravine through which the stream runs cutting across the strata, so that every natural facility is afforded for economi-

cal working. Some of the veins are said to produce good smith coal, while the coke made from coal mined here (specimens of which were brought away) appears to be of excellent quality.

On the Pend d'Oreille division, after leaving Ainsworth, the line passes through about twenty-four miles of open, sandy country, and then enters a treeless, rolling region, with soil of volcanic ash, and covered with a growth of "bunch grass." This continues as far as my journey reached—is said to extend to Spokane Falls—and constitutes a portion of the great wheat country of Eastern Washington Territory.

It must not be supposed that the entire country within the limits of the grant on this division are of this character. The western limits embrace a portion of territory bordering on the Columbia, covered with drifting sands from the river; but it is probable that 60 per cent. of the grant on this division is available for cultivation.

The extreme southern edge of the grant in Montana was also reached during the last inspection trip made.

Here there are good grazing lands, and it is said, that farther down in the valleys there are lands suitable for cultivation.

OREGON AND CALIFORNIA RAILROAD.

Inspection made in May, 1880. This road extends from East Portland to Roseburg, Oregon, a distance of 197.36 miles. It obtained a grant of lands by act of Congress approved July 25, 1866. This grant in Oregon was made for the purpose of aiding the construction of a railroad and telegraph line from Portland to the south line of the State, there to connect with a line—aided by a similar grant in California—from the Central Pacific Railroad to the Oregon line.

The road in Oregon has been built to Roseburg, and the road in California to Redding, in that State, leaving a gap between the termini of about 240 miles, measured in a straight line.

The crop of last year in the Willamette Valley having been a failure, the earnings of the road have fallen off largely, and its previously embarrassed financial condition aggravated.

The maximum grades are 103 feet per mile going northward, and 93 feet per mile going southward. The extreme grades only hold for about $\frac{1}{16}$ of a mile each, the maximum grade, other than these, being less than 90 feet per mile in either direction. The sharpest curve is 10 degrees, and 77 per cent. of the line is tangent.

On June 30, 1880, there were, according to the company's report, 8 miles of track laid with steel rail weighing 56 pounds per yard. No renewals of main track were made or new sidings laid during the year ending on that date.

A portion of the road is partially ballasted with gravel.

The iron is laid with plain double fish-joints, and the steel with double fish-joints composed of one plain and one angle fish bar. Rails are laid "hap-hazard" on soft-wood ties. The line and surface of track are inferior—much of the iron worn, and many joints loose.

The switches are "stub," with upright stands with targets, and rail frogs. There are 23 spans of "Howe" truss bridge of an aggregate length of 3,753 feet, supported in most cases on trestle or crib piers, and 64,236 linear feet of pile and trestle bridging. No renewals are reported as having been made during the year.

Bridge floors are provided with guards.

There is a new two-story frame passenger station and eating-house at Albany. At other points the buildings are generally either old or temporary.

The shops near East Portland are temporary structures, and consist of machine-shop, car-shop, and engine-house. The company have 8 water stations, 15 section-houses, and 25 tool-houses.

The rolling stock is maintained in very good condition. Neither safety platforms nor train brakes are used.

The company also own and operate a steam ferry across the Willamette River at Portland to connect its station in East Portland with the main city.

OREGON CENTRAL RAILROAD.

Inspection made June, 1880.

This line extends from the city of Portland to Saint Joseph, Oregon.

It obtained a grant of lands under the act of Congress approved May 4, 1870; was examined by commissioners and accepted by the President of the United States, as provided in the act named, but no lands were ever patented to it. During the past year the road has not paid operating expenses.

The maximum grade going southward occurs in the city of Portland, and is 198 feet per mile. Going northward, it is 80 feet per mile; and the sharpest curve is 12 degrees. The line is laid with iron, 50 and 56 pounds per yard, on soft wood ties.

There are 140 lineal feet of "Howe" truss, 60 lineal feet of "Queen post" truss, and 13,404 lineal feet of pile and trestle bridge on the line.

The buildings are temporary frame structures.

The road is in very bad condition. It is a difficult road to maintain, even with sufficient means, owing to the wet, clayey nature of its cuttings, the want of suitable ballast, and the large amount of bridging.

A railroad has been built from the southern terminus of the Oregon Central to Corvallis (and is to be extended to Junction) by the Western Oregon Railroad Company, and the Oregon Central is now operated under lease by this company. This road was passed over on the same date on which the inspection of the Oregon Central was made.

It is laid with steel, 50 pounds per yard, with fish-joint of one plain and one angle bar, on soft ties.

The maximum grade is 63 $\frac{1}{2}$ feet per mile, and the sharpest curve 4 degrees. It was in an unfinished condition at the time of inspection, out of line and surface, with wet, muddy cuts, and without ballast. It has not, thus far, paid running expenses.

SAINT LOUIS AND SAN FRANCISCO RAILWAY.

Inspection made in April, 1880, of the main line from Pacific, Mo., to Vinita, Indian Territory.

This company, at the present time, operates the following-named lines of road, viz: ~~the~~

<i>Owned.</i>		
Pacific, Mo., to line of Indian Territory.....	Miles.	293
<i>Leased.</i>		
Atlantic and Pacific, in Indian Territory.....		34
Saint Louis, Wichita, and Western—Pierce City, Mo., to Oswego, Kans., and branch to Joplin, Mo.....		53
Missouri and Western—Oswego, Kans., to Wichita, Kans.....		144
Joplin Railroad—Joplin, Mo., to Girard, Kans.....		38
Joint use of track—Saint Louis to Pacific, Mo.....		37
		<hr/> 336
Total.....		<hr/> 629

The line, after leaving Pacific, passes through a good farming region for a few miles. It then strikes and commences to ascend the Ozark range of hills, and passes through a rough, wild country, covered with scrub oak, but interspersed, here and there, with good farm lands.

At about Marshfield, 178 miles from Pacific, it enters the rich farming region of Southwestern Missouri, which continues to the west line of the State.

The through traffic of the road comes from Texas, via the Missouri, Kansas and Texas Railway; and it also derives considerable business from its Kansas lines, and from the Joplin lead region.

Its local trade is composed largely of iron ore, which is shipped to Saint Louis.

The company has made no report to this office of the characteristics of its line, but the maximum grade is understood to be 105 feet per mile, and the sharpest curve ten degrees.

Many of the embankments are narrow.

Between Pacific and Pierce City about fifty per cent. of the line is ballasted with broken stone and gravel, and a portion of the remaining fifty per cent. back filled with stone.

Renewals are made with steel rails, with which there were about 130 miles of track laid at the time of inspection.

The steel is 56 pounds per yard, laid on oak ties, with plain double-fish joint, with "Verona" nut locks, and joints opposite and supported.

Where steel has been laid, the track is in fair line and surface, and the same may also be said as to the ballasted portion generally, although some curves, and even tangents, need lining up. The roadway would be much improved if the *débris* were removed from the ditches in the cuts. The practice in this respect seems to be to only clean the ditches when the *débris* reaches the top of the rail.

The switches are "split-rail" with springs, and "stub," with upright stands with targets.

No provision is made for lighting switches at night.

The bridges are "Howe," and Post combination, truss; a few trussed girders and pile.

There is one new iron bridge, near Lebanon. A considerable amount of work has recently been done renewing and repairing bridges. The floors are provided with guard rails. The new masonry is of good quality, laid in mortar. That under the trussed girders is generally good dry masonry, although in a few places it needs rebuilding.

The station buildings are as good as is necessary for the class of business offered.

There are frame engine-houses at Pacific and Dixon, each with 9 stalls and wooden turn-table, and one at Pierce City, with 3 stalls.

The principal shops of the company are at Springfield, and consist of machine-shop, engine-house with 12 stalls, smith-shop, car and paint shops, brass foundry, and oil house, all of brick, and a frame car-house. The passenger and freight houses at this point are also of brick. The shops appear to be too small for the wants of the road.

Along the line of the road old material is generally well gathered up, but at stations and at the shop-yard there is a want of order and neatness.

The water supply is obtained from surface ponds in most cases, and can be enlarged as the wants of the service demand.

Of the 29 water stations, twenty-one have tanks of the frost-proof pattern; at fourteen of them the pumping is done with steam, and at ten horse-power is used.

The rolling stock appears to be in good condition. It was increased during 1879 by the addition of 11 locomotives and 370 cars of all classes.

"Westinghouse" air-brakes and "Miller" platforms are used on the passenger equipment.

MISSOURI, KANSAS AND TEXAS RAILWAY.

Inspection made of land grant portion only, in April, 1880.

The land grant portion of this road extends from Junction City, Kans., to the north line of the Indian Territory, a distance of 183 $\frac{2}{3}$ miles.

From Junction City to Parsons, 156 miles, the road forms the Neosho division, the remaining distance from Parsons to the line of the Indian Territory forming a part of the main line.

The Neosho division, running as it does, in a direction from a little west of north to south of east, is cut off from through traffic, and obtains only the local trade of the country through which it passes.

It is probable that it would never have been built but for the valuable grant of lands lying in the fertile valley of the Neosho.

On the whole land-grant road the maximum grade is 61.2 feet per mile, the sharpest curve 5 degrees, and 84 per cent. of the line tangent. The road is laid with 45 and 56 pound iron, and 52-pound steel, 18 $\frac{1}{2}$ miles of the latter material having been laid between Parsons and the Indian Territory line.

The steel is laid with fish-joint composed of one plain and one angle bar, while the iron is nearly all laid with old style of chair joints.

The ties are cedar and oak.

At points, here and there, difficult to maintain, stone ballast has been put in, amounting in all to about 7 miles. Elsewhere, the road is kept up with the native soil.

As a whole, although needing some renewals of iron and ties, the roadway is in commendable condition, considering the light business done, the large percentage of chair iron, and the nature of the soil; and shows evidence of intelligent supervision. Much of the road-bed is well shaped and neatly maintained with ditches well cleaned.

The switches are "stub," with upright stands with targets, and rail and "Mansfield" frogs.

The side-tracks aggregate 9 $\frac{1}{2}$ miles.

The bridging is as follows, viz:

	Feet.
Ordinary "Howe" truss	401
"Combination" trusses	5,098
Girders on masonry	2,635
Pile and trestle	2,288
Total	10,492

The bridges are in general good repair, with well-laid floors and guard-rails. Most of the bridge masonry is good, all that has been rebuilt being "first-class" laid in mortar. On a portion of the road the masonry under girder bridges needs renewing.

The station buildings are nearly all cheap wooden structures, but are doubtless sufficient for the business offered.

At Parsons, the passenger station is a two-story brick building, the upper portion being used for offices.

The shops at Parsons consist of a stone engine-house with 14 stalls, built with iron roof trusses, slate roof, stone engine-pits paved, and cast-iron turn-table; a stone machine-shop with iron trusses and slate roof; and a frame smith-shop with 10 forges; all in good repair. There

are 13 water stations, at the majority of which, the tanks and wind-mills are new.

The rolling-stock forms a part of the general equipment of the road, and being so small in quantity, no opinion could be formed as to the general condition of this portion of the company's property. "Miller" platforms and "Westinghouse" air-brakes are used.

ATCHISON, TOPEKA AND SANTA FE RAILROAD.

Inspection made in April, 1880.

This line extends from Atchison, Kans., to the west line of the State, 470.58 miles, and received a grant of lands for that distance under the act of Congress approved March 3, 1863, granting lands to the State of Kansas for the purpose of aiding "the construction of certain railroads and telegraphs in said State."

It is regretted that the report on this road cannot be made more complete; but, contrary to general custom, the courtesy of detailing an executive officer familiar with the property to accompany the inspection, and give such information as might be desired, was not observed by this company; nor was the train furnished for the inspection provided with either conductor, brakeman, drinking-water, or fire.

On June 30, 1880, the lines owned and operated were as follows, viz :

	Miles.
Owned.....	470. 58
Operated, but not owned.....	843. 42
Total.....	1,314. 00

Since that date extensions have been made to the operated lines in New Mexico.

The following report is on the land-grant portion only:

The maximum grade going east is 62 feet per mile, and going west 63.7 feet per mile.

The sharpest curve is 6 degrees, and 86 per cent. of the line is tangent.

On about 33 per cent. of the line the embankments are narrow.

The masonry under bridges is generally good, especially that recently built, which is first-class.

There are pieces of track, here and there, ballasted with broken stone, aggregating, at a rough estimate, about 30 miles. In addition to this there is some track back-filled with stone.

The ties are not laid as closely together as is desirable with the weight of rail used. Notwithstanding the large renewals of ties that have been made, a great many new ties are still needed. The rails are iron, 56 pounds, and steel, 52 and 56 pounds, per yard.

The steel is laid with double angle-bar fish splices, with suspended opposite joints.

During the year 1879, 70 miles of track were renewed with steel, being 15 per cent. of the whole line, notwithstanding which there remains a good deal of track needing immediate renewal.

Between Atchison and Topeka the track is not well kept up, line and surface being inferior and ditches not cleaned. Between Topeka and the State line it is much better, quite a large portion of the road-bed being well shaped and much of the track in fair line and surface.

A want of care is shown in neglecting to keep joints well screwed up, and in throwing the débris from the ditches up on the slope where it will soon wash down again.

The switches are chiefly "stub" with upright switch-stand with targets.

The total length of side-track December 31, 1879, was 64.6 miles.

The bridges are of various styles, including "Howe," combination, and "Pratt" trusses, bow-string girder, plain girder, pile, and trestle.

At the Kaw River, two spans of wrought iron "Pratt" truss have been recently put up on first-class masonry piers. There still remain at this bridge one span combination, and one of "Howe" truss with a trestle approach.

All of the newer bridge floors are laid with good oak floor-timbers, and have timber guard-rails.

The buildings are in average good condition.

There is a stone freight-house at Atchison, and a new stone passenger station at Topeka.

The shops at Topeka are of stone and brick, and consist of engine-house, with stalls for 16 locomotives, machine, smith, and car shops, etc.

There are also stone engine houses at Emporia and Nickerson, with stalls for 16 and 13 locomotives respectively.

There are 34 water stations on the line, at 6 of which there are frost-proof tanks. The water supply is apparently ample, although trouble is experienced in common with other roads in the western country on account of alkali in the water.

The rolling stock is kept in good condition. The passenger stock is equipped with "Westinghouse" automatic brakes and "Miller" platforms, and all coaches, engine trucks, and tenders, are being provided with paper wheels with steel tires, those under coaches being 42 inches in diameter.

SAINT PAUL AND DULUTH RAILROAD.

Inspection made in August, 1880.

The road owned and operated June 30, 1880, was as follows, viz:

Owned.	Miles.
Saint Paul and Duluth.....	156
Knife Falls Branch.....	6
	<hr/> 162
Leased.	
Stillwater and Saint Paul.....	13
Total.....	<hr/> 175

During the present season a branch has been constructed from Wyoming to Centre City, a distance of 11 miles.

The 24 miles from North Pacific Junction to Duluth is owned jointly with the Northern Pacific Railroad Company. The road for the greater portion of its length passes through a swampy and timbered country, interspersed with occasional stretches of farm lands.

No report of alignment and grades has been made to this office, but it is understood that the maximum grade occurs at Saint Paul, and is somewhat over 100 feet per mile. There is also a grade of 76 feet per mile occurring between Duluth and North Pacific Junction. The location is bad in detail, sharp reversions and "broken-back" curves occasionally occurring.

Between North Pacific Junction and Duluth the embankments are narrow. The cuts on this portion of the road slide in badly and the ditches require attention.

Perhaps 15 per cent. of the whole line is more or less thoroughly

ballasted with gravel. The ties are of oak and soft woods, chiefly the latter. The track between Duluth and North Pacific Junction has been partially and the Saint Paul hill wholly laid with steel. A portion of the track is in fair condition, but on much of it the joints are down, splices loose, and track out of line, showing a want of proper supervision. The switches are "stub," with revolving upright stands with targets.

The bridges appear to be generally in good repair. Between Duluth and North Pacific Junction 3 of the 5 high trestles have been rebuilt with stone foundations, and the other 2 will be finished before the close of the present season. All new bridges have floors provided with guard rails.

No special examination was made of buildings. They appear to be in ordinary good repair, and adapted to the wants of the road.

The water supply is ample.

The equipment appears to be in average condition. A portion of it belongs to the Northwestern Equipment Trust.

The passenger stock is equipped with "Westinghouse" automatic brakes and "Miller" platforms.

OTHER ROADS.

Of the roads coming under the provisions of the act of June 19, 1878, mentioned previously as having been passed over but not inspected, I can only say that on all of them there are evidences of permanent improvement.

CONCLUSION.

As business increases and resources are greater, lines of road must necessarily be made more permanent, and efficient appliances for the safe and speedy transaction of business introduced into all branches of the service.

Speaking generally, much remains to be done; in changes of line and grades to avoid errors of original location, thereby increasing the commercial value of the road; in the substitution of permanent for temporary structures; in the more thorough construction of bridges; in the introduction of safety switches and efficient signals; in a more thorough and scientific maintenance; in an increase of paying load in proportion to dead weight; in a more economical adaptation of motive power; and, in many cases, in the attainment of a better discipline.

I desire to acknowledge the courtesy that has been shown by the officers of all the roads (except one) which it has been my duty to examine.

Respectfully,

A. B. NICHOLS,
Railroad Engineer.

Hon. THEOS. FRENCH,
Auditor of Railroad Accounts, Department of the Interior.

APPENDIXES.

- A. List of companies included in act of Congress approved June 19, 1878.
- B. List of railroads aided, giving grants made.
- C. Termini of aided roads constructed, giving conditions and restrictions.
- D. Departmental circulars and orders, and opinions affecting subsidized and land-grant railroads.
- E. Forms for reports now in use by this office.
- F. Recent enactments affecting Pacific railroads.
- G. United States laws relating to the Northern Pacific, Atlantic and Pacific, and other railroads.
- H. General laws affecting railroads.
- I. Laws of the United States relating to telegraph lines and companies.
- K. Articles of consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, entered into January 24, 1880, taking effect January 26, 1880.
- L. Recent decisions of the Supreme Court and of circuit courts of the United States affecting railroad companies.
- M. Recent decisions of the United States Court of Claims affecting land-grant railroad companies.
- N. Government directors of the Union Pacific Railroad.
- O. United States bond and interest account with subsidized railroads.
- P. United States transportation account with subsidized railroads.
- Q. "Five per cent. of net earnings" accounts of the Kansas Pacific Railway, Central Branch Union Pacific Railroad, and Sioux City and Pacific Railroad companies.
- R. Sinking funds of the Union and Central Pacific Railroad companies held in the Treasury of the United States.
- S. Business of railroads east and west of the Mississippi River.
- T. Extracts from Poor's Manual of Railroads for 1879 and 1880.
- V. Reports of the Texas and Pacific Railway Company for the fiscal years ending June 30, 1878 and 1879.

TABLES.

- 1. Organization.
- 2. Ownership.
- 3. Officers.
- 4. Characteristics.
- 5. Cost of roads and equipment.
- 6. Statistics of funded debt.
- 7. Liabilities and assets.
- 8. Receipts.
- 9. Expenditures.
- 10. Operations of land departments.
- 11. Comparative statements of earnings and expenses.

APPENDIX A.

List of railroad companies included in the act of Congress approved June 19, 1878 entitled "An act to create an Auditor of Railroad Accounts, and for other purposes."

Bonds have been loaned, and lands, right of way, depot grounds, and materials from adjacent lands have been granted by the United States to the following corporations or their predecessors, to aid in the construction of railroads "in whole or in part west, north, or south of the Missouri River, namely:

		Miles of railroad constructed and aided as above.
Union Pacific Railway Company:		
Union Pacific	1,038.68	
Kansas Pacific	393.9425	
		1,432.6225
Central Pacific Railroad Company:		
Central Pacific	737.50	
Western Pacific	123.16	
		860.66
Central Branch Union Pacific Railroad Company		100
Sioux City and Pacific Railroad Company		101.77
Total		2,495.0525

NOTES.

The Union Pacific Railway Company is the title of the company formed by the consolidation* of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, January 24, 1880, and in the above list is successor of the Union Pacific Railroad and the Kansas Pacific Railway companies only, the Denver Pacific not having received any subsidy bonds.

The title of the Kansas Pacific Railway Company was formerly Union Pacific Railway Company, Eastern Division, successor to the Leavenworth, Pawnee, and Western Railroad Company.

The Central Pacific Railroad Company is the title of the company formed by consolidation of the Central Pacific Railroad Company of California, with the Western Pacific Railroad Company, June 23, 1870.

The Central Branch Union Pacific Railroad Company is the successor of the Atchison and Pike's Peak Railroad Company, the assignee of the Hannibal and Saint Joseph Railroad Company so far as relates to the Pacific Railroad acts.

Lands, right of way, depot grounds, and materials from adjacent lands have been granted by the United States to the following corporations or their predecessors, to aid in the construction of railroads "in whole or in part west, north, or south of the Missouri River," namely:

		Miles of railroad constructed and aided as above.
Union Pacific Railway Company:		
Kansas Pacific	244.6575	
Denver Pacific	105.89	
		350.5475
Central Pacific Railroad Company		151.81
Burlington and Missouri River Railroad Co. in Nebraska		190.66
Texas and Pacific Railway Company		None.
Southern Pacific Railroad Company		578.61
Northern Pacific Railroad Company		560
Atlantic and Pacific Railroad Company		34†
Saint Louis and San Francisco Railway Company		91
Oregon and California Railroad Company		200
Oregon Central Railroad Company		50†
Total		2,206.6275

* The articles of consolidation are printed on page 221 of this report.

† This 34 miles of railroad being in the Indian Territory, the company has received no lands therefor.

‡ No lands have yet been certified to this company.

The Union Pacific Railway Company succeeds to the land-grant of the Kansas Pacific and Denver Pacific companies, the Denver Pacific being the assignee of the Kansas Pacific so far as relates to the land-grant.

The Central Pacific Railroad Company, by virtue of their consolidation August 22, 1870, succeeds to the land-grant of the California and Oregon Railroad Company.

The Burlington and Missouri River Railroad Company in Nebraska is assignee of the Burlington and Missouri River Railroad Company of Iowa, to which last-named company the grants enumerated were made.

The name and title of the Texas Pacific Railroad Company was changed to Texas and Pacific Railway Company by act of Congress approved May 2, 1872.

By purchase of that portion of the railroad located in the State of Missouri, the Saint Louis and San Francisco Railway Company became the successor of the Atlantic and Pacific Railroad Company so far as relates to grants in that State.

The Oregon and California Railroad Company is the successor of the Oregon Central Railroad Company of Salem, Oregon.

Lands, right of way, depot grounds, and materials from adjacent lands have been granted by the United States to the several States hereafter named, for the purpose of aiding in the construction of certain railroads in those States, "in whole or in part west, north, or south of the Missouri River," and the grants have been received by the companies named, or their predecessors, as follows:

Company now owning the railroad.	State to which grant was made.	Miles of railroad constructed and aided as above.
Hannibal and Saint Joseph	Missouri	206.41
Missouri Pacific	do	37
Saint Louis and San Francisco	do	202.125
Saint Louis, Iron Mountain and Southern	Missouri and Arkansas	475
Little Rock and Fort Smith	Arkansas	165.6
Memphis and Little Rock	do	133
Missouri, Kansas and Texas	Kansas	183.2
Atchison, Topeka and Santa Fé	do	470.58
Kansas City, Lawrence and Southern	do	143.82
Saint Joseph and Western	do	236
Chicago, Burlington and Quincy	Iowa	279
Chicago, Rock Island and Pacific	do	317.75
Cedar Rapids and Missouri River	do	274.2
Dubuque and Sioux City	do	142.89
Iowa Falls and Sioux City	do	183.09
Saint Paul and Sioux City	Iowa and Minnesota	245
Winona and Saint Peter	Minnesota	323.22
Southern Minnesota	do	147
Southern Minnesota Extension	do	152.6
Saint Paul and Duluth	do	156
Saint Paul, Minneapolis and Manitoba	do	602.47
Stillwater and Saint Paul	do	13
Western of Minnesota	do	60.5
Chicago, Milwaukee and Saint Paul	Minnesota and Iowa	534
Wisconsin Central	Wisconsin	256.37
Chicago, Saint Paul and Minneapolis	do	156
North Wisconsin	do	80
Vicksburg, Shreveport and Pacific	Louisiana	94
Total		6,260.925

* The Missouri, Kansas and Texas Railway Company has constructed 246 miles of railroad in the Indian Territory.

NOTES.

The Missouri Pacific and the Saint Louis and San Francisco Railway companies are the successors of the Southwest Branch of the Pacific Railroad Company of Missouri as to rights and conditions under the land-grant; the former from Saint Louis to Pacific, and the latter from Saint Louis to Springfield, Mo.

The Saint Louis, Iron Mountain and Southern Railway Company is successor of the Iron Mountain and Southern and the Cairo and Fulton.

The Missouri, Kansas and Texas Railway Company is successor of the Union Pacific, Southern Branch.

The Kansas City, Lawrence and Southern Railroad Company is the successor of the Leavenworth, Lawrence and Galveston, which company succeeded the Leavenworth, Lawrence and Fort Gibson.

The Saint Joseph and Western Railroad Company is the successor of the Saint Joseph and Denver City.

The Chicago, Burlington and Quincy Railroad Company is successor of the Burlington and Missouri River Railroad Company of Iowa, with which it has been consolidated.

The Chicago, Rock Island and Pacific Railroad Company is successor of the Mississippi and Missouri River Railroad Company.

The Illinois Central Railroad Company is the lessee of the Dubuque and Sioux City and the Iowa Falls and Sioux City railroads.

The Chicago and Northwestern Railway Company is the lessee of the Cedar Rapids and Missouri River, and proprietor of the Winona and Saint Peter railroads.

The Saint Paul and Sioux City and the Sioux City and Saint Paul Railroad companies succeeded the Minnesota Valley Railroad Company, and were consolidated October 1, 1879. The Saint Paul and Sioux City Railroad Company also succeeds to the land-grant of the Saint Paul, Stillwater and Taylor's Falls Railroad by virtue of consolidation.

The Chicago, Saint Paul and Minneapolis Railway Company is successor to the West Wisconsin, which derived its grant as the Tomah and Lake Superior Railroad.

The Southern Minnesota Railway Company, successor to the Root River Valley and Southern Minnesota, is leased to the Chicago, Milwaukee and Saint Paul Railway Company.

The Saint Paul and Duluth Railroad Company is successor to the Lake Superior and Mississippi River, and operates the railroad of the Stillwater and Saint Paul Railroad Company under lease—the latter-named company deriving its land-grant rights as successor to the Saint Paul and Stillwater.

The Saint Paul, Minneapolis and Manitoba Railway Company is a consolidation of the Saint Paul and Pacific, First Division; Saint Paul and Pacific, First Division, Branch Line; and Saint Paul and Pacific, Saint Vincent Extension—the grants having been originally made for the Saint Paul and Pacific Railroad.

The Western Railroad of Minnesota is leased to the Northern Pacific Railroad Company. The Western derived its grant as Saint Paul and Pacific, Brainerd Branch.

The Chicago, Milwaukee and Saint Paul Railway Company is the successor of the McGregor and Missouri River in Iowa, and of the Hastings and Dakota, and Minnesota Central in Minnesota, by virtue of ownership.

The Wisconsin Central Railroad Company is successor of the Portage, Winnebago and Lake Superior.

The Vicksburg, Shreveport and Pacific Railroad Company is the successor of the Vicksburg, Shreveport and Texas.

RECAPITULATION.

	Miles.
Corporations aided with bonds and lands	2, 495. 0525
Corporations aided with lands	2, 206. 6275
States aided with lands, for railroads	6, 260. 925
Total	10, 962. 605

Indianapolis and Sioux City	May 13, 1886; June 2, 1884	553,457.86
St. Paul and Sioux City	do	983,023.94
St. Paul and Sioux City	March 3, 1857; May 12, 1864; March 3, 1865;	1,200,358.01
St. Paul and Sioux City	July 13, 1866	
St. Paul and Sioux City	May 12, 1864; July 13, 1866	806,908.80
St. Paul and Sioux City	June 3, 1856; May 5, 1864	802,816.80
St. Paul and Sioux City	do	843,497.56
St. Paul and Sioux City	do	
St. Paul and Sioux City	May 5, 1864; July 13, 1866	800,504.09
St. Paul and Sioux City	March 3, 1857; March 3, 1865; July 13, 1866	2,031,337.89
St. Paul and Sioux City	March 3, 1857; joint resolution July 12, 1862;	
St. Paul and Sioux City	March 3, 1865; July 13, 1866; March 3, 1871;	
St. Paul and Sioux City	March 3, 1857; March 3, 1865; July 13, 1866	179,738.01
St. Paul and Sioux City	July 4, 1866; July 13, 1866	454,956.86
St. Paul and Sioux City	May 12, 1864	251,063.24
St. Paul and Sioux City	July 4, 1866; July 13, 1866	225,178.66
St. Paul and Sioux City	May 5, 1864	575,844.56
St. Paul and Sioux City	June 3, 1856	353,211.70
Total	64,623,512	31,956,857.87

* Duluth to Thomson (24 miles) is owned jointly, but operated independently by the Northern Pacific and Saint Paul and Duluth Railroad Companies.
 † The Northern Pacific Railroad Company has the perpetual right of way from Saint Paul to Sauk Rapids (7½ miles) over this road.

APPENDIX C.

Conditions and restrictions in force June 30, 1880, in regard to transportation for the government over the subsidized and land-grant railroads included in the act of Congress approved June 19, 1878.

Termini of aided railroad.		Miles.	Company operating.	Conditions as to rates.	Restrictions as to payments for services rendered for the government.
From—	To—				
Missouri River, near Omaha, Nebr.	Ogden, Utah	1,023.68	Union Pacific Railroad	Fair and reasonable (A)	Whole amount of compensation to be retained (O).
Eastern State line of Kansas.	Denver, Colo.	638.6	do	do	Whole amount of compensation to be retained (P).
Denver, Colo.	Cheyenne, Wyo.	105.89	do	do	Whole amount of compensation to be retained (Q).
West Saint Joseph, Kans.	Hastings, Nebr.	228	do	Fair and reasonable (K)	Whole amount of compensation to be retained (K).
Ogden, Utah	Sacramento, Cal.	742.5	Central Pacific Railroad	Fair and reasonable (A)	Whole amount of compensation to be retained (O).
American River Bridge, near Sacramento, Cal.	San José, Cal.	123.16	do	do	No payments can be made (S).
Junction at Roseville, Cal.	Redding, Cal.	151.81	do	Transportation to be at cost of the company when so required by the government (B). Not higher than individuals are charged for like service, and Congress may regulate (D).	Whole amount of compensation to be retained (Q).
Huron, Cal.	Colorado River, opposite Yuma, Ariz.	528.28	do	do	Whole amount of compensation to be paid; no restrictions whatever against this company.
San José, Cal.	Tres Pinos, Cal.	50.33	Southern Pacific Railroad	do	Whole amount of compensation to be retained (P).
Sioux City, Iowa	Fremont, Nebr.	101.77	Sioux City and Pacific Railroad	Fair and reasonable (A)	No payments can be made except through Court of Claims (T).
Atchison, Kans.	Waverlyville, Kans.	100	Missouri Pacific Railway	do	Do.
Saint Louis, Mo.	Pacific, Mo.	37	do	Free from toll or other charge (E)	Do.
Do	do	37	Saint Louis and San Francisco Railway.	do	Do.
Pacific, Mo.	Springfield, Mo.	203.125	do	do	Do.
Springfield, Mo.	Western State line of Missouri.	91	do	Not higher than individuals are charged for like service, and Congress may regulate (D).	Whole amount of compensation to be paid; no restrictions whatever against this company.
Duluth, Minn.	Junction near Thompson, Minn.	24	Northern Pacific Railroad	Free from toll or other charge (E)	No payments can be made except through the Court of Claims (T).
Junction near Thompson, Minn.	Bismarck, Dak.	424	do	Not higher than individuals are charged for like service (C).	Whole amount of compensation to be paid; no restrictions whatever against this company.
Tacoma, Wash.	Wilkeson, Wash.	31	do	do	Do.
Kalama, Wash.	Tacoma, Wash.	105	do	do	Do.

Saint Paul, Minn.....	75.5	do	Free from toll or other charge (E) ...	No payments can be made but through the Court of Claims (T).
Sauk Rapids, Minn.....	60.5	do	do	Do.
Brainerd, Minn.....	200	Oregon and California Railroad	Transportation to be at cost of the company when so required by the government (B).	No payments can be made (S).
Portland, Oreg.....		do	No conditions (M)	Whole amount of compensation to be paid; no restrictions whatever against this company.
Do.....	50	Western Oregon Railroad.....	Free from toll or other charge (E) ...	No payments can be made but through the Court of Claims (T).
Hannibal, Mo.....	206.41	Hannibal and Saint Joseph Railroad.	No conditions (N)	Whole amount of compensation to be paid; no restrictions whatever against this company.
Plattsmouth, Nebr.....	190.66	Burlington and Missouri River Railroad in Nebraska.	Free from toll or other charge (E) ...	No payments can be made but through the Court of Claims (T).
Burlington, Iowa.....	279	Chicago Burlington and Quincy Railroad.	Free from toll or other charge (E) ...	Whole amount of compensation to be paid; no restrictions whatever against this company.
Pilot Knob, Mo.....	80	Saint Louis, Iron Mountain and Southern Railway.	Transportation to be at cost of company when so required by the government (G).	No payments can be made but through the Court of Claims (T).
Bird's Point, Mo.....	395	do	do	Do.
Hopfield, Ark.....	133	Memphis and Little Rock Railroad.	do	No payments can be made (S).
Little Rock, Ark.....	165.6	Little Rock and Fort Smith Railway.	do	Do.
Junction City, Kans.....	183.2	Missouri, Kansas and Texas Railway.	Free from toll or other charge (F); free of charge (H); free from all cost or charge when so required by any department of the government (I).	Do.
Atchison, Kans.....	470.58	Atchison, Topeka and Santa Fé Railroad.	Free from toll or other charge (F) ...	No payments can be made but through the Court of Claims (T).
Lawrence, Kans.....	143.32	Kansas City, Lawrence and Southern Railroad.	do	Do.
Davenport, Iowa.....	317.75	Chicago, Rock Island and Pacific Railroad.	Free from toll or other charge (E) ...	Do.
Cedar Rapids, Iowa.....	271.6	Chicago and Northwestern Railway.	do	Do.
Lyons, Iowa.....	2.6	do	do	Do.
Wauona, Minn.....	323.22	do	do	Do.
Big Sioux River, Dak.....	142.89	Illinois Central Railroad	do	Do.
Dubuque, Iowa.....	183.69	do	do	Do.
Iowa Falls, Iowa.....	122	do	do	Do.
Saint Paul, Minn.....		Chicago, Saint Paul, Minneapolis and Omaha Railway.	do	Do.
Saint James, Minn.....	123	do	do	Do.
Le Mars, Iowa.....	25	do	do	Do.
Siox City, Iowa.....	156	do	do	Do.
Hudson, Wis.....		do	do	Do.
Eleven miles south of Warren, Wis.....		do	do	Do.
Stillwater, Minn.....	21	do	do	Do.
North Wisconsin Junction, Wis.....	80	do	do	Do.
Saint Paul, Minn.....	156	Saint Paul and Duluth Railroad	do	Do.

APPENDIX C.—Conditions and restrictions in force June 30, 1880, in regard to transportation for the government, &c.—Continued.

Termini of aided railroad.			Company operating.	Conditions as to rates.	Restrictions as to payments for services rendered for the government.
From—	To—	Miles.			
Stillwater, Minn.	White Bear, Minn.	13	Saint Paul and Duluth Railroad	Free from toll or other charge (E) . . .	No payments can be made but through the Court of Claims (T).
Saint Paul, Minn.	Sank Rapids, Minn.	75.5	{ Saint Paul, Minneapolis and } Manitoba Railway.	do	Do.
Saint Anthony, Minn.	Breckenridge, Minn.	207.1		do	Do.
East Saint Cloud, Minn.	Saint Vincent, Minn.	319.87		do	Do.
Saint Paul, Minn.	Southern State line of Minnesota.	112		do	Do.
Minneapolis, Minn.	Junction with main line.	9	Chicago, Milwaukee and Saint Paul Railway.	Transportation to be at cost of company when so required by the government (L).	No payments can be made (S).
Near Houston, Minn.	Western State line of Minnesota.	299.6	do	Free from toll or other charge (E) . . .	No payments can be made but through the Court of Claims (T).
Calmar, Iowa	Sheldon, Iowa	211	do	Transportation to be at cost of company when so required by the government (L).	No payments can be made (S).
Hastings, Minn.	Western State line of Minnesota.	202	do	Free from toll or other charge (E) . . .	No payments can be made but through the Court of Claims (T).
Portage City, Wis.	Ashland, Wis.	256.37	Wisconsin Central Railroad	Free from toll or other charge (E) . . .	No payments can be made but through the Court of Claims (T).
Delta, La.	Monroe, La.	73	Vicksburg Shreveport and Pacific Railroad.	do	Do.
Shreveport, La.	Texas State line.	21	Texas and Pacific Railway	do	Do.

CONDITIONS IN DETAIL AS TO RATES.

(A.)

UNION PACIFIC, CENTRAL PACIFIC, CENTRAL BRANCH UNION PACIFIC, SIOUX CITY AND PACIFIC.

[Act July 1, 1862, sec. 6, U. S. Statutes, vol. 12, page 493.]

"That said company — shall, at all times, transmit dispatches over said telegraph line, and transport mails, troops, and munitions of war, supplies, and public stores upon said railroad for the government, when required to do so by any department thereof, and that the government shall at all times, have the preference in the use of the same for all the purposes aforesaid [at fair and reasonable rates of compensation, not to exceed the amounts paid by private parties for the same kind of service.]"

(B.)

CENTRAL PACIFIC (OREGON BRANCH); OREGON AND CALIFORNIA.

[Act July 25, 1866, sec. 5, U. S. Statutes, vol. 14, page 240.]

"That the grants aforesaid are made upon the condition that the said companies shall keep said railroad and telegraph in repair and use, and shall at all times, transport the mails upon said railroad, and transmit dispatches by said telegraph line for the Government of the United States when required so to do by any department thereof, and that the government shall at all times have the preference in the use of said railroad and telegraph therefor at fair and reasonable rates of compensation, not to exceed the rates paid by private parties for the same kind of service.

"And said railroad shall be and remain a public highway for the use of the Government of the United States, free of all toll or other charges upon the transportation of the property or troops of the United States; and the same shall be transported over said road at the cost, charge, and expense of the corporations or companies owning or operating the same, when so required by the Government of the United States."

(C.)

NORTHERN PACIFIC.

[Act July 2, 1864, U. S. Statutes, vol. 13, page 368, sec. 5.]

"That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service."

SEC. 11, page 370. "That said Northern Pacific Railroad, or any part thereof, shall be a post-route and a military road, subject to the use of the United States, for postal, military, naval, and all other government service, and also subject to such regulations as Congress may impose restricting the charges for such government transportation."

(D.)

ATLANTIC AND PACIFIC; SOUTHERN PACIFIC; SAINT LOUIS AND SAN FRANCISCO.

[Act July 27, 1866, U. S. Statutes, vol. 14, sec. 5, page 295.]

"That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service."

SEC. 11, page 297. "That said — railroad, or any part thereof, shall be a post-route and military road, subject to the use of the United States for postal, military, naval, and all other government service, and also subject to such regulations as Congress may impose restricting the charges for such government transportation."

(E.)

MISSOURI PACIFIC; SAINT LOUIS AND SAN FRANCISCO; HANNIBAL AND SAINT JOSEPH.

[Act June 10, 1852, U. S. Statutes, vol. 10, sec. 4, page 9.]

"And the said railroads shall be and remain public highways for the use of the Government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States."

SAINT LOUIS, IRON MOUNTAIN AND SOUTHERN; MEMPHIS AND LITTLE ROCK; LITTLE ROCK AND FORT SMITH.

[Act February 9, 1853, U. S. Statutes, vol. 10, page 156.]

SEC. 4. "And the said railroad and branches shall be and remain a public highway for the use of the Government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States."

CHICAGO, BURLINGTON AND QUINCY; CHICAGO, ROCK ISLAND AND PACIFIC; CEDAR RAPIDS AND MISSOURI RIVER, NOW OPERATED BY CHICAGO AND NORTHWESTERN; DUBUQUE AND SIOUX CITY, AND IOWA FALLS AND SIOUX CITY, NOW OPERATED BY ILLINOIS CENTRAL.

[Act May 15, 1856, U. S. Statutes, vol. 11, page 10.]

SEC. 3. "And the said railroads shall be and remain public highways for the use of the Government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States."

VICKSBURG, SHREVEPORT AND PACIFIC.

[Act June 3, 1856, U. S. Statutes, vol. 11, page 19.]

SEC. 3. "And the said railroads shall be and remain a public highway for the use of the Government of the United States, free from toll or other charge, upon the transportation of any property or troops of the United States."

CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA.

[Act June 3, 1856, U. S. Statutes, vol. 11, page 20.]

SEC. 3. "And the said railroads shall be and remain public highways for the use of the Government of the United States free from toll or other charge upon the transportation of property or troops of the United States."

WISCONSIN AND SAINT PETER, NOW OPERATED BY THE CHICAGO AND NORTHWESTERN; SAINT PAUL, MINNEAPOLIS AND MANITOBA; WESTERN OF MINNESOTA, OPERATED BY THE NORTHERN PACIFIC; CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA; CHICAGO, MILWAUKEE AND SAINT PAUL.

[Act March 3, 1857, U. S. Statutes, vol. 11, page 196.]

SEC. 3. "And the said railroads and branches shall be and remain public highways for the use of the Government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States."

WISCONSIN CENTRAL; SAINT PAUL AND DULUTH.

[Act May 5, 1864, U. S. Statutes, vol. 13, page 65.]

SEC. 5. "And the said railroad shall be and remain a public highway for the use of the Government of the United States, free from all toll or other charge, for the transportation of any property or troops of the United States."

CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA; CHICAGO, MILWAUKEE AND SAINT PAUL.

[Act May 12, 1864, U. S. Statutes, vol. 13, page 73.]

SEC. 3. "And the said railroads shall be, and remain, public highways for the use of the Government of the United States, free of all toll or other charges upon the transportation of any property or troops of the United States."

(F.)

ATCHISON, TOPEKA AND SANTA FE; KANSAS CITY, LAWRENCE AND SOUTHERN; MISSOURI, KANSAS AND TEXAS.

[Act March 3, 1863, U. S. Statutes, vol. 12, page 773.]

SEC. 3. "And the said railroads and branches shall be and remain public highways, for the use of the Government of the United States, free from all toll or other charge upon the transportation of any property or troops of the United States."

(G.)

CAIRO AND FULTON, NOW OPERATED BY THE SAINT LOUIS, IRON MOUNTAIN AND SOUTHERN; LITTLE ROCK AND FORT SMITH; MEMPHIS AND LITTLE ROCK.

[Act July 28, 1866, U. S. Statutes, vol. 14, page 338.]

SEC. 1. "That all property and troops of the United States shall at all times be transported over said railroad and branches at the cost, charge, and expense of the company or corporation owning or operating said road and branches respectively, when so required by the Government of the United States."

(H.)

MISSOURI, KANSAS AND TEXAS.

[Act July 1, 1864, U. S. Statutes, vol. 13, page 340.]

SEC. 1. "That said railroad shall be a public highway and shall transport troops and munitions of war of the United States free of charge."

(I.)

MISSOURI, KANSAS AND TEXAS.

[Act July 28, 1866, U. S. Statutes, vol. 14, page 290.]

SEC. 3. "That said company, after the construction of its road, shall keep it in repair and use, and shall at all times be in readiness to transport troops, munitions of war, supplies, and public stores upon its road for the government when required to do so by any department thereof, the government at all times having the preference in the use of the road for all purposes aforesaid at fair and reasonable rates of compensation, not exceeding that paid by private individuals or the average rate paid for like services on other roads."

(K.)

SAINT JOSEPH AND WESTERN, NOW OPERATED BY THE UNION PACIFIC.

[Act July 23, 1866, U. S. Statutes, vol. 14, page 211.]

SEC. 3. "That said company, after the construction of its road, shall keep it in repair and use, and shall at all times be in readiness to transport troops, munitions of war, supplies, and public stores upon its road for the government when required to do so by any department thereof, the government at all times having the preference in the use of the road for all purposes aforesaid at fair and reasonable rates of compensation, not exceeding that paid by private individuals or the average rate paid for like services on other roads."

(L.)

EASTINGS AND DAKOTA AND SOUTHERN MINNESOTA, NOW OPERATED BY THE CHICAGO, MILWAUKEE AND SAINT PAUL.

[Act July 4, 1866, U. S. Statutes, vol. 14, page 88.]

"Sec. 3. And the said railroad[s] shall be and remain public highways for the use of the Government of the United States, free of all toll or other charges upon the transportation of any property or troops of the United States, and the same shall at all times be transported at the cost, charge, and expense in all respects of the company or corporation, or their successors or assigns, having or receiving the benefit of the land grants herein made."

(M.)

OREGON CENTRAL.

[Act May 4, 1870, U. S. Statutes, vol. 16, page 94.]

No conditions.

(N.)

BURLINGTON AND MISSOURI RIVER, IN NEBRASKA.

[Act July 2, 1864, U. S. Statutes, vol. 13, page 364.]

No conditions.

RESTRICTIONS IN DETAIL AS TO PAYMENTS.

(O.)

UNION PACIFIC; CENTRAL PACIFIC; CENTRAL PACIFIC (WESTERN PACIFIC).

[Act May 7, 1878, Section 2, U. S. Statutes, vol. 20, page 58.]

"That the whole amount of compensation which may from time to time, be due to said several railroad companies respectively for services rendered for the government shall be retained by the United States, one-half thereof to be presently applied to the liquidation of the interest paid and to be paid by the United States upon the bonds so issued by it as aforesaid, to each of said corporations severally, and the other half thereof to be turned into the sinking fund hereinafter provided, for the uses therein mentioned."

(P.)

UNION PACIFIC (LATE KANSAS PACIFIC); SIOUX CITY AND PACIFIC; MISSOURI PACIFIC (CENTRAL BRANCH UNION PACIFIC).

[Act July 2, 1864, section 5, U. S. Statutes, vol. 13, page 359.]

"And that only one-half of the compensation for services rendered for the government by said companies shall be required to be applied to the payment of the bonds issued by the government in aid of the construction of said roads."

[Extract from decision of Supreme Court U. S., 91 Sup. Ct. Reports, page 90.]

"This provision was without doubt intended merely to modify the original act, so as to allow the government to retain only one-half of such compensation, instead of all. That act applied the whole compensation 'to pay the bonds and interest,' and it cannot be supposed that Congress intended to relinquish the right thereby secured to make the application in the first place to the interest, and then to the principal. The purpose could have been nothing more than to surrender the right to retain the whole of the company's earnings for services to the government, and to accept, in lieu of, the right to retain the half."

There is no implication that the government shall keep it; and, if not, who is to get it? Assuredly the companies who have earned it."

[Section 5260, Revised Statutes of the United States.]

"The Secretary of the Treasury is directed to withhold all payments to any railroad company and its assigns, on account of freights or transportation over their respective roads of any kind, to the amount of payments made by the United States for interest upon bonds of the United States issued to any such company, and which shall not have been reimbursed, together with the five per centum of net earnings due and unapplied, as provided by law."

[Section 5261, Revised Statutes of the United States.]

"Any such company may bring suit in the Court of Claims to recover the price of such freight and transportation, and in such suit the right of such company to recover the same upon the law and the facts of the case shall be determined, and also the rights of the United States upon the merits of all the points presented by it in answer thereto by them; and either party to such suit may appeal to the Supreme Court; and both said courts shall give such cause or causes precedence of all other business."

[Extract from decision of the Supreme Court, 91 Sup. Ct. Reports, page 91.]

"It is contended that this act repeals that portion of the charter of the company which contains the provisions we have discussed. But, manifestly, its purpose was very different. Although it directs the Secretary of the Treasury to withhold all payments to the companies on account of freights and transportation, it at the same time authorizes any company thus affected to bring suit in the Court of Claims 'for such freight and transportation,' and in such suit 'the right of such company to recover the same upon the law and the facts shall be determined, and also the rights of the United States upon the

merits of all the points presented by it in answer thereto by them.' This means nothing more or less than the remission to the judicial tribunals of the question, whether this company, and others similarly situated, have the right to recover from the government one-half of what they earned by transportation; and this question is to be determined upon its merits."

(See also Treasury Department circulars, Appendix D, page 106 of this report.)

(Q.)

UNION PACIFIC (LATE DENVER PACIFIC); CENTRAL PACIFIC (LESSEE OF THE SOUTHERN PACIFIC OF CALIFORNIA).

[99 Supreme Court Reports, page 462, *United States vs. Denver Pacific Railway and Telegraph Company.*]

"Since delivering the opinion in this case, our attention has been called to the fact that, whilst affirming generally the judgment of the court below, we did not expressly pass upon the question of the right set up by the government to retain one-half of the amount of compensation due from it to the claimant for the transportation of mails and other public property. This point was not overlooked in rendering our judgment in the case. We cannot conceive upon what principle the retention can be claimed, since the object of retaining the compensation for such services, or any portion thereof, as expressed in the sixth section of the act of 1862, was to apply the amount so retained to the debt due to the government for subsidy bonds granted to the companies that should receive the same. But the claimants in this case received no such bonds, and we decided that neither the company, nor its railroad or property, is liable in any way for the payment of any debt incurred for such bonds received by the Kansas Pacific Railway Company. Consequently there is no room for the application of the right of retention in this case, and the judgment of the Court of Claims was properly rendered for the whole amount of such compensation due."

(See Treasury Department circulars, Appendix D, page 106 of this report.)

(R.)

UNION PACIFIC (SAINT JOSEPH AND WESTERN).

[Extract from opinion of the Attorney-General of the United States, page —, Appendix D of this report.]

"Though the Supreme Court held in *United States vs. Kansas Pacific Railway Company* (99 U. S., 453) that the bonds issued to that corporation are not a lien beyond the 100th meridian, nor is the company liable for five per centum of its net earnings beyond that point, yet in the following case, *United States vs. Denver Pacific Railway Company* (99 U. S., 460), the court in a note, based its exemption of the road from liability to have its compensation for government transportation withheld upon the fact that the company (Denver Pacific Company) was not indebted to the United States. The Central and Union Pacific Railroad companies, owning, leasing, controlling, and operating the branches referred to in this inquiry are indebted to the United States upon subsidy bonds. In this state of the decisions, I advise the retention of all compensation to these roads for services upon such branches, so that the question can be judicially determined."

(S.)

CENTRAL PACIFIC (OREGON DIVISION); OREGON AND CALIFORNIA.

See act July 25, 1866, U. S. Statutes, vol. 14—"B" of this appendix.

SAINT LOUIS, IRON MOUNTAIN AND SOUTHERN (CAIRO AND FULTON); MEMPHIS AND LITTLE ROCK; LITTLE ROCK AND FORT SMITH.

See act July 23, 1866, U. S. Statutes, vol. 14—"G" of this appendix.

MISSOURI, KANSAS AND TEXAS.

See acts quoted in ("F"), ("H"), and ("I") of this appendix.

CHICAGO, MILWAUKEE AND SAINT PAUL (NEAR HOUSTON TO WESTERN STATE LINE OF MINNESOTA), AND (HASTINGS TO WESTERN STATE LINE OF MINNESOTA).

See act of July 4, 1866, U. S. Statutes, vol. 14—"L" of this appendix.

(T.)

MISSOURI PACIFIC: SAINT LOUIS AND SAN FRANCISCO; NORTHERN PACIFIC (DULUTH TO THOMPSON, SAUK RAPIDS TO BRAINERD, AND SAINT PAUL TO SAUK RAPIDS); HANNIBAL AND SAINT JOSEPH; CHICAGO, BURLINGTON AND QUINCY (BURLINGTON TO MISSOURI RIVER); SAINT LOUIS, IRON MOUNTAIN AND SOUTHERN (PILOT KNOB TO POPLAR BLUFF); ATCHISON, TOPEKA AND SANTA FE; KANSAS CITY, LAWRENCE AND SOUTHERN; CHICAGO, ROCK ISLAND AND PACIFIC, (DAVENTPORT TO COUNCIL BLUFFS); CHICAGO AND NORTHWESTERN, (CEDAR RAPIDS TO COUNCIL BLUFFS, LYONS TO CLINTON, AND WINONA TO BIG SIOUX RIVER); ILLINOIS CENTRAL (DUBUQUE TO SIOUX CITY); CHICAGO, SAINT PAUL, MINNEAPOLIS AND OMAHA (SAINT PAUL TO SIOUX CITY, 11 MILES SOUTH OF WARREN'S TO HUDSON, STILLWATER TO SAINT PAUL, NORTH WISCONSIN JUNCTION TO CHANDLER); SAINT PAUL AND DULUTH; SAINT PAUL, MINNEAPOLIS AND MANITOWA; CHICAGO, MILWAUKEE AND SAINT PAUL, (SAINT PAUL AND MINNEAPOLIS TO SOUTHERN STATE LINE OF MINNESOTA, AND CALMAR TO SHELTON; WISCONSIN CENTRAL (PORTAGE CITY TO ASHLAND); VICKSBURG, SHREVEPORT AND PACIFIC; TEXAS AND PACIFIC (SHREVEPORT TO TEXAS LINE).

See circular of War Department, page 112 of this report.

[Extract from decision of Supreme Court in "Atchison case," 93 Supreme Court Reports, pages 451, 452, 453, and 454.]

"In view of the legislative history and practice referred to, it seems impossible to resist the conclusion, when we meet with a legislative declaration to the effect that a particular railroad shall be a public highway, that the meaning is that it shall be open to the use of the public with their own vehicles; and that when Congress, in granting lands in aid of such a road, declared that the same shall be and remain a public highway for the use of the Government of the United States, it only means that the government shall have the right to use the road, but not that it shall have the right to require its transportation to be performed by the railroad company. And when this right of the use of the road is granted 'free from all toll or other charge for transportation of any property or troops of the United States,' it only means that the government shall not be subject to any toll for such use of the road. This, we think, is the natural and most obvious meaning of the language used, when viewed in the light afforded by the history of railroad legislation in this country. This was also the interpretation put by the executive department of the government upon the reservation in question prior to the passage of the acts of 1864.

"All that the act reserves is the free use of the railroad. Of course this implies, also, the free use of all fixtures and appurtenances forming part of the road, and which are essential to its practical use, such as turn-tables, switches, depots, and other necessary appendages. We are of opinion that the reservation in question secures to the government only a free use of the railroads concerned, and that it does not entitle the government to have troops or property transported by the companies over their respective roads free of charge for transporting the same."

[Act of June 16, 1874, U. S. Statutes, vol. 18, page 74.]

"That no part of the money appropriated by this act shall be paid to any railroad-company for the transportation of any property or troops of the United States over any railroad which, in whole or in part, was constructed by the aid of a grant of public land on the condition that such railroad should be 'a public highway for the use of the Government of the United States free from toll or other charge,' or upon any other conditions for the use of such road, for such transportation; nor shall any allowance be made out of any money appropriated by this act for the transportation of officers of the Army over any such road when on duty and, under orders as a military officer of the United States. But nothing herein contained shall be construed as preventing any such railroad from bringing a suit in the Court of Claims for the charges for such transportation, and recovering for the same, if found entitled thereto by virtue of the laws in force prior to the passage of this act."

[Act of June 22, 1874, U. S. Statutes, vol. 18, page 138.]

"That no part of the sum appropriated by any provision of this act shall be paid to any railroad-company which has received a grant of land on the condition that its road should be a public highway for the transportation of the property and troops of the United States free from toll or other charge."

[Act of March 3, 1879, U. S. Statutes, vol. 20, page 390.]

"For the payment of arrears of Army transportation due such land grant railroads as have not received aid in government bonds as compensation was withheld from, under the acts of June sixteenth and twenty-second, eighteen hundred and seventy-four, and March third, eighteen hundred and seventy-five, to be adjusted by the proper accounting officers in accordance with the decision of the Supreme Court in cases decided under the said acts, to be paid as other Army transportation, but in no event shall more than fifty per cent. of the full amount allowed by the Quartermaster-General be paid until the decision of the Court of Claims be had in each case, three hundred thousand dollars or so much thereof as may be necessary."

See decision of Court of Claims, December term, 1879, in case of *Atchison, Topeka and Santa Fé Railroad Company v. The United States*, page 224 of this report.

APPENDIX D.

Departmental Circulars and Orders affecting the subsidized and land-grant railroads included in the act of Congress approved June 19, 1878.

DEPARTMENT CIRCULARS.

TREASURY DEPARTMENT CIRCULARS.

[Circular.]

TRANSPORTATION OVER PACIFIC RAILROADS.

(1879. Department No. 162. Secretary's Office.)

TREASURY DEPARTMENT, SECRETARY'S OFFICE,
Washington, D. C., November 29, 1879.

The attention of all persons concerned is invited to the provisions of section 5260 of the Revised Statutes, concerning compensation to certain Pacific Railroads, below enumerated, as follows:

"SEC. 5260. The Secretary of the Treasury is directed to withhold all payments to any railroad company and its assigns, on account of freights or transportation over their respective roads of any kind, to the amount of payments made by the United States for interest upon bonds of the United States issued to any such company, and which shall not have been reimbursed, together with the five per centum of net earnings due and unapplied, as provided by law."

In accordance with the above provision of law, no payments will hereafter be made, directly or indirectly, in favor of any of the railroads in question. No person entitled to transportation at the public expense will incur expenditure therefor over any of these roads with a view of being reimbursed for the amount, but should secure from the proper authority an order for such transportation; and the accounting officers of this department will allow any road presenting such order, duly receipted, credit for the amount found due, to be applied as required by law.

In case the expense of such transportation is properly payable from any appropriation under the control of the Treasury Department, the necessary order will be furnished only by direction of the Secretary of the Treasury.

Union Pacific Railroad: From Council Bluffs, Iowa, to Ogden, Utah; 1,033.46 miles.
Central Pacific Railroad: From Ogden, Utah, to San José, California, *via* Niles; 865.66 miles.

Kansas Pacific Railway: From Kansas City, Missouri, to Denver, Colorado; 638.6 miles.

Central Branch Union Pacific Railroad: From Atchison to Waterville, Kansas; 100 miles.

Sioux City and Pacific Railroad: From Sioux City, Iowa, to Fremont, Nebraska, *via* California Junction; 101.77 miles.

JOHN SHERMAN,
Secretary.

[Circular.]

TRANSPORTATION SERVICES PERFORMED BY PACIFIC RAILROAD COMPANIES.

(1880. Department No. 55. Secretary's Office.)

TREASURY DEPARTMENT,
Washington, D. C., June 24, 1880.

The following opinion of the Attorney-General, in relation to withholding payments from Pacific Railroad Companies for transportation services performed for the Government, is published for the information of all concerned.

H. F. FRENCH,
Acting Secretary.

DEPARTMENT OF JUSTICE,
Washington, June 18, 1880.

SIR: Yours of the 7th ultimo refers to me certain questions suggested by the Quartermaster-General, to each of which I subjoin my answer in the order of presentation:

"1st. Shall all compensation due for transportation services rendered for the Quartermaster's Department over those portions of the Union and Central Pacific Railroads which were built by aid of government bonds be withheld?"

Answer. Yes. The second section of the act of May 7, 1878, chapter 96, expressly declares: "SEC. 2. That the whole amount of compensation which may, from time to time, be due to said several railroad companies respectively, for services rendered for the government, shall be retained by the United States," &c. (20 Stat., 58). This act was intended to change the pre-existing law, and could hardly be made more explicit.

"2d. Shall full compensation be made for all transportation services rendered for the Quartermaster's Department over those portions of roads owned, leased, controlled, and operated by said Union and Central Pacific Railroad Companies which were not built by aid of government bonds, or shall all compensation due for such services be withheld?"

Answer. Though the Supreme Court held, in *United States vs. Kansas Pacific Railway Company* (99 U. S., 455), that the bonds issued to that corporation are not a lien beyond the 100th meridian, nor is the company liable for *five per cent.* of its earnings beyond that point, yet, in the following case, *United States vs. Denver Pacific Railway Company* (99 U. S., 460), the court, in a note, based its exemption of the road from liability to have its compensation for government transportation withheld upon the fact that the company (Denver Pacific Railway Company) was *not indebted* to the United States. The Central and Union Pacific Railroad Companies, owning, leasing, controlling, and operating the branches referred to in this inquiry, *are indebted* to the United States upon subsidy bonds. In this state of the decisions, I advise the retention of *all* compensation to these roads for services upon such branches, so that the question can be judicially determined.

"3d. Shall *all* compensation due for transportation services rendered for the Quartermaster's Department over that portion of the Kansas Pacific Railroad—393 $\frac{1}{2}$ miles—which was built by aid of government bonds, or *only one-half* of such compensation, be withheld?"

Answer. *All* compensation should be withheld over the entire length of this road, under Revised Statutes, section 5260, still in force, which declares:

"The Secretary of the Treasury is directed to withhold all payments to any railroad company and its assigns, on account of freights or transportation over their respective roads of any kind, to the amount of payments made by the United States for interest upon bonds of the United States issued to any such company, and which shall not have been reimbursed, together with the five per centum of net earnings due and unapplied, as provided by law."

"4th. Shall any part, and, if so, what part, of the compensation due for transportation services rendered for the Quartermaster's Department over that portion of said Kansas Pacific Railroad—244 miles—which was built without aid of government bonds, be withheld?"

Answer. For reasons indicated in my reply to your second question, I think *all* compensation should be withheld as to this portion of that road, as well as to that in aid of which bonds issued.

Your fifth question states that the Kansas Pacific and Denver Pacific have been consolidated with the Union Pacific, and asks if payment for services over these lines should be withheld and applied to the debt of the Union Pacific.

Answer. As stated in the second answer, the compensation should be entirely withheld, until otherwise directed by the court, because the Kansas Pacific Railway Company is indebted for interest paid by the United States upon its subsidy bonds. (R. p., sec. 5260.)

6th. Shall *all* compensation due for transportation for the Quartermaster's Department over those portions of the Sioux City and Pacific and the Central Branch Union Pacific Railroads, which were built by aid of government bonds, be withheld, or *shall only one-half* of such compensation be withheld?"

Answer. All; because derelict in payment of interest. (R. S., sec. 5260.)

"7th. Shall any part, and, if so, what part, of the compensation due for transportation services rendered for the Quartermaster's Department over lines owned, leased, controlled, and operated by said Sioux City and Pacific and Central Branch Union Pacific Railroad Companies, which were not built by aid from government bonds, be withheld?"

Answer. All; for reasons indicated in the second answer. (R. S., sec. 5260.)

None of these corporations appear to be affected by the act relating to the compensation of roads which received grants of land upon the condition of a free use of the road.

Of course considerations additional to those above suggested would arise as to any such company.

The letters of the Secretary of War and of the Quartermaster-General are herewith returned, as requested.

Very respectfully, your obedient servant,

CHAS. DEVENS,
Attorney-General.

Hon. JOHN SHERMAN,
Secretary of the Treasury.

"Lists of roads owned, leased, controlled, and operated" by the subsidized Pacific Railroad Companies are given in "Table No. 1—Organization," attached to this report.

INTERIOR DEPARTMENT CIRCULARS.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., March 9, 1878.

Circular of instructions under the act of Congress approved March 3, 1875, "Granting to railroads the right of way through the public lands of the United States."

[CHAPTER 152.—AN ACT granting to railroads the right of way through the public lands of the United States.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the right of way through the public lands of the United States is hereby granted to any railroad company duly organized under the laws of any State or Territory, except the District of Columbia, or by the Congress of the United States, which shall have filed with the Secretary of the Interior a copy of its articles of incorporation, and due proofs of its organization under the same, to the extent of one hundred feet on each side of the central line of said road; also the right to take from the public lands adjacent to the line of said road, material, earth, stone, and timber necessary for the construction of said railroad; also grounds adjacent to such right of way for station-buildings, depots, machine-shops, side tracks, turn-outs, and water-stations, not to exceed in amount 20 acres for each station to the extent of one station for each ten miles of its road.

SEC. 2. That any railroad company whose right of way, or whose track or road bed upon such right of way, passes through any canyon, pass, or defile, shall not prevent any other railroad company from the use and occupancy of the said canyon, pass, or defile, for the purposes of its road, in common with the road first located, or the crossing of other railroads at grade. And the location of such right of way through any canyon, pass, or defile shall not cause the disuse of any wagon or other public highway now located therein, nor prevent the location through the same of any such wagon road or highway where such road or highway may be necessary for the public accommodation; and where any change in location of such wagon road is necessary to permit the passage of such railroad through any canyon, pass, or defile, said railroad company shall, before entering upon the ground occupied by such wagon road, cause the same to be reconstructed at its own expense in the most favorable location, and in as perfect a manner as the original road: *Provided*, That such expenses shall be equitably divided between any number of railroad companies occupying and using the same canyon, pass, or defile.

SEC. 3. That the legislature of the proper Territory may provide for the manner in which private lands and possessory claims on the public lands of the United States may be condemned; and where such provisions shall not have been made, such condemnation may be made in accordance with section three of the act entitled "An act [to amend an act entitled an act] to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes, approved July first, eighteen hundred and sixty-two," approved July second, eighteen hundred and sixty-four.

SEC. 4. That any railroad company desiring to secure the benefits of this act, shall, within twelve months after the location of any section of twenty miles of its road, if the same be upon surveyed lands, and, if upon unsurveyed lands, within twelve months after the survey thereof by the United States, file with the register of the land office for the district where such land is located a profile of its road; and upon approval thereof by the Secretary of the Interior the same shall be noted upon the plats in said office; and

thereafter all such lands over which such right of way shall pass shall be disposed of subject to such right of way: *Provided*, That if any section of said road shall not be completed within five years after the location of said section, the rights herein granted shall be forfeited as to any such uncompleted section of said road.

SEC. 5. That this act shall not apply to any lands within the limits of any military, park, or Indian reservation, or other lands specially reserved from sale, unless such right of way shall be provided for by treaty stipulation or by act of Congress heretofore passed.

SEC. 6. That Congress hereby reserves the right at any time to alter, amend, or appeal this act, or any part thereof.

Approved March 3, 1875.

The regulations under the law are as follows:

I. Any railroad company desiring to obtain the benefits of the law is required to file—

First. A copy of its articles of incorporation, duly certified to by the proper officer of the company, under its corporate seal.

Second. A copy of the State or Territorial law under which the company was organized (when organized under State or Territorial law), with certificate of the governor or secretary of the State or Territory, that the same is the existing law.

Third. When said law directs that the articles of association or other papers connected with the organization be filed with any State or Territorial officer, the certificate of such officer that the same have been filed according to law, with the date of the filing thereof.

Fourth. The official statement, under seal, of the proper officer, that the organization has been completed; that the company is fully authorized to proceed with the construction of the road according to the existing law of the State or Territory; and that the copy of the articles filed with the Secretary of the Interior is true and correct.

Fifth. A true list, duly verified by the sworn statement of the president, under the seal of the company, showing the names and designation of its respective officers at the date of the presentation of the proofs at the department.

These may be transmitted directly to the Secretary of the Interior or through this office, or they may be filed with the register of the land district in which the principal terminus of the road is to be located, who will forward them to this office.

II. Upon the location of any section of the line of route of its road, not exceeding twenty miles in length, the company must file with the register of the land district in which such section of the road or the greater portion thereof is located, a map, for the approval of the Secretary of the Interior, showing the termini of such portion of the road, its length, and its route over the public lands according to the public surveys.

The map must be filed within twelve months after the location of such portion of the road, if located upon surveyed lands, and, if upon unsurveyed lands, within twelve months of the survey thereof. It must bear—

First. Affidavit of the chief engineer of the company (or person employed to make the survey, if the company has no chief engineer), setting forth that the survey of the line of route of the company's road from — to —, a distance of — miles (giving termini and distance), was made by him (or under his direction) as chief engineer of the company (or as surveyor employed for the purpose, if such be the case), under authority of the company, on or between certain dates (giving the same); and that such survey is accurately represented on the map. If the affidavit is made by the chief engineer of the company, it must be signed by him officially.

Second. Official certificate of the president of the company, attested by its secretary under its corporate seal, regarding the person signing the affidavit, either as to his being the chief engineer of the company or as to his employment by the company for the purpose of making such survey; that the survey was made under authority of the company; that the line of route so surveyed and represented by the map was adopted by the company, by resolution of its board of directors of a certain date (giving the date), as the definite location of the line of route of the company's road from — to —, a distance of — miles (giving termini and distance), and that the map has been prepared to be filed for the approval of the Secretary of the Interior, in order that the company may obtain the benefits of the act of Congress approved March 3, 1875, entitled "An act granting to railroads the right of way through the public lands of the United States."

III. It will be observed that the requirements of the law regarding the filing of the proper papers and maps are conditions precedent to the obtaining of the right to construct a railroad over the public lands, or to take therefrom material, earth, stone, and timber for its construction, or to occupy them for station or other purposes. It is therefore imperative that proper steps, as pointed out in this circular, should be taken by a company, and the approval of the Secretary of the Interior obtained, prior to the construction of any part of its road or its occupancy of the public lands in any manner.

IV. Should the company desire to construct its road over lands prior to their survey, it may file, in manner as heretofore indicated, a map of its surveyed route, without waiting until the lands are surveyed, and, upon approval thereof, may proceed with construction, but, immediately on the survey of the lands over which the road passes, the company must also file a map showing the line of route of its road over such lands, in order that the proper notes and records for the protection of its rights may be made.

V. Upon construction of any section of the line of its road the company must file with the register of the proper land district, for transmission to this office, a map of such constructed portion of road, bearing—

First. Affidavit of the chief engineer or person under whose supervision the portion of the road was constructed, that its construction was commenced on ——— and finished on ——— (giving dates); that the line of constructed road is accurately represented upon the map, and that it conforms to the line of located route which received the approval of the Secretary of the Interior on ——— (giving date).

Second. Certificate of the president of the company, attested by the secretary under the corporate seal, that the portion of the road indicated by the map was actually constructed at the time as sworn to by the chief engineer of the company (or person making the affidavit), and on the exact route shown on the map; that in its construction the road does not deviate from the line of route approved by the Secretary of the Interior, and that the company has in all respects complied with the requirements of the act of March 3, 1875, granting right of way through the public lands.

Any variation within the limits of one hundred feet from the central line of the road as located will not be considered a deviation from such line, but where, upon construction, it is found necessary to transgress the limits within which the company has right of way, the company must at once file proper map of amended route for approval.

VI. If the company desires to avail itself of the provision of the law which grants the use of "ground adjacent to the right of way for station buildings, depots, machine-shops, side tracks, turn-outs, and water-stations, not to exceed in amount twenty acres for each station, to the extent of one station for each ten miles of its road," it must file for approval, in each separate instance, a plat showing, in connection with the public surveys, the surveyed limits and area of the ground desired. Such plat must bear—

First. Affidavit of the chief engineer or surveyor by whom or under whose supervision the survey was made, to the effect that the plat accurately represents the surveyed limits and area of the grounds required by the company for station or other purposes, under the law (stating the purposes), in ——— (giving section, township, range, and State or Territory); that the company has occupied no other grounds for station or other similar purposes upon public lands within ten miles of the grounds designated on the plat, and that, in his belief, the grounds so represented are actually and to their entire extent required by the company for the necessary uses contemplated by law.

Second. Certificate of the president of the company, attested by the secretary under the corporate seal, that the survey of the tract represented on the plat was made under authority and by direction of the company by or under supervision of its chief engineer (or person making the survey), whose affidavit is attached; that such survey accurately represents the grounds actually and to their entire extent required by the company for station (or other) purposes in ——— (giving section, township, range, State or Territory), allowed by the provisions of the act of Congress, approved March 3, 1875, granting to railroads the right of way through the public lands; that the company has no station or other grounds upon public lands within a distance of ten miles from the grounds represented on the plat; and that the company, by resolution of its board of directors of a certain date (giving the date), directed the proper officers to present the plat for the approval of the Secretary of the Interior in order that the company may obtain the use of the grounds under the law above referred to.

VII. Registers at the various land offices are directed to require that such papers and maps herein referred to as may be filed with them for transmission to this office shall conform to these regulations. Where differences of opinion may arise between themselves and the persons filing papers, respecting the proper construction of these requirements, the papers may be transmitted with letter stating the differing opinions.

They are also instructed, in any case where information is received by them of the construction of railroads within their districts of the rights of which they have no official knowledge, to promptly advise this office of the facts in order that proper information or directions in the matter may be given them.

J. A. WILLIAMSON,
Commissioner.

Approved:

C. SCHURZ,
Secretary of the Interior.

MARCH 22, 1878.

Opinion of the Attorney-General in regard to the Atlantic and Pacific Railroad.

DEPARTMENT OF JUSTICE,
Washington, October 26, 1880.

SIR: Your letter of the 15th instant presents for my consideration the application of the Atlantic and Pacific Railroad Company for the appointment of three commissioners to examine a section of twenty-five miles of its road west from Albuquerque, New Mexico, under section four of the act of Congress of July 27, 1866.

The Atlantic and Pacific Railroad Company was created by and organized under the act of Congress above mentioned and was granted the right of way, and the public lands of the United States, within certain defined limits, from Springfield, Mo., through the Indian Territory and New Mexico, to the Pacific coast.

Before 1871 it appears that the company constructed its road from Springfield to the western boundary line of the State of Missouri, and this portion of the road was duly accepted by the President, and patents for the land issued.

This action was in accordance with the provision of section four of the granting act, which provides that when the company shall have twenty-five consecutive miles of any portion of said railroad ready for the service contemplated, the President of the United States shall appoint three commissioners to examine the same; and, if it shall appear that twenty-five consecutive miles of road have been completed in all respects required by the act, the commissioners shall so report to the President of the United States, and patents to lands, as provided for by the third section of the act shall be issued to the company.

The company next completed thirty-four miles in the Indian Territory prior to 1871, but, because the United States had not extinguished the Indian title, no steps were taken for the issuance of patents along the road in that Territory.

From the early part of the year 1871, down to August or September of the present year, no section or portion of the road was constructed by the company; in fact, no work of any kind or description was done by the company on the road.

Section 8 of the act makes it a condition of each and every grant, right, and privilege given to the company that the company "shall commence the work on said road within two years from the approval of this act by the President, and shall complete not less than fifty miles per year after the second year, and shall construct, equip, furnish and complete the main line of the whole road by July 4, 1878."

The company has not conformed to this condition, as it appears that for six years prior to July 4, 1878, no road was constructed, and, in addition, that for two years subsequent to that date no portion of the road was constructed.

The ninth section of the act recites that the conditional grants were made and accepted upon the further condition that "if the company make any breach of the conditions and allow the same to continue for upwards of one year, then in such case, at any time hereafter, the United States may do any and all acts and things which may be needful and necessary to insure a speedy completion of the said road."

By section 20, Congress has retained the right to add to, alter, amend, or repeal this act, having due regard for the rights of said railroad company.

Having in view the provisions and conditions of the granting act, and the failure on the part of the company to perform the conditions prescribed in the manner recited, you request my opinion upon the following question:

"Is it within the power and the duty of the Executive to appoint commissioners to examine the section of road submitted by the Atlantic and Pacific Railroad Company, to accept the same if completed in all respects required by the act of July 27, 1866, and to cause patents to be issued to said company for lands situated opposite to, and coterminous with, the section of road if completed?"

As I think the grant to this railroad must be treated as a present grant, to be made afterwards definite as from time to time the various portions of the road are completed, the only inquiry would seem to be whether or not the conditions upon which the company received the grant are in their nature conditions precedent or subsequent. If conditions precedent, the failure to perform such conditions would deprive the road of its right to make application for the benefits of the act, if after such conditions were violated, it proceeded to build portions of the road. If conditions subsequent, then it would be necessary for the United States to take advantage of such conditions by acting under the ninth section of the act, and proceeding itself to do acts and things which might be safe or necessary to insure a speedy completion of the road, or by declaring a forfeiture of the grant by legislative action, or by providing for enforcing the same by a judicial proceeding. If the United States were disposed to revest in itself, or to enforce a forfeiture of the lands granted, it would be necessary to take some action indicative of that intention.

The case of *Schulenberg v. Harriman* is apparently decisive of the present inquiry. That was the case of a grant of lands to the State of Wisconsin to aid in the construction of a certain railroad within that State by the act of June 3, 1856. The language of the first section of that act was "That there be, and hereby is, granted to the State

of Wisconsin" the lands specified. Similar language is found in the third section of the act of July 27, 1866, "That there be, and hereby is, granted to the Atlantic and Pacific Railroad Company," &c. In that case the grant was made upon a condition that, if the road be not completed within ten years "no further sale shall be made, and the lands unsold shall revert to the United States." The road had not been completed within the time required for its construction, which had not been extended, and Congress had passed no act, nor provided for any judicial proceedings to enforce any forfeiture of the grant for failure to construct the road within the period prescribed. Upon this state of facts it was held that the grants to the State of Wisconsin were grants in *presenti*, which acquired precision, as the route of the road became fixed by its location; and that the lands had not reverted to the United States, although the road was not constructed within the period prescribed, no action having been taken, either by legislation or judicial proceedings, to enforce a forfeiture of the grants.

The conditions in the present case must be held, in view of this authority, to be conditions subsequent. Apparently they are much more strongly so than in the case referred to. The section nine, in which they are found, distinctly contemplates that the United States will do some act, and may do certain acts, upon the breach of the conditions.

I am, therefore, of opinion that the grant to the railroad has not been forfeited by its failure to build its road within the time named in the act, no action by reason of its failure to perform the conditions having been taken by authority of Congress. It having, then, a present grant, even if it be treated as one liable to forfeiture, it has still a right to proceed to construct the road; and until, in some form, advantage shall be taken of the breach of the conditions, it would be the duty of the Executive Department to give it the benefit of the grant.

I am also of opinion, therefore, that it would be within the power and duty of the Executive to appoint commissioners to examine the section of road submitted by the Atlantic and Pacific Railroad Company; to accept the same, if completed in all respects required by the act of July 27, 1866; and to cause patents to be issued to said company for lands situated opposite to, and coterminous with, the section of road, if completed.

I have the honor, in this connection, to refer to the opinion delivered to your department by me, of the date of November 29, 1879 (upon which I understand the department has acted), in which the case of *Schulenberg v. Harriman*, *supra*, was considered.

Very respectfully, your obedient servant,

CHAS. DEVENS,
Attorney-General.

HON. CARL SCHURZ,
Secretary of the Interior.

WAR DEPARTMENT CIRCULAR.

[General Orders No. 69.]

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 30, 1880.

1. By direction of the Secretary of War the following instructions and accompanying tables (Nos. 1 to 5, inclusive) of land-grant and bonded railroads revised and corrected to date, are published for the information and guidance of all concerned:

2. Table No. 1 gives the names of the companies now operating the land-grant and bonded railroads; the former names of the roads; the termini of the land-grant and bonded portions of the roads; the dates of the laws (statutes and pages) relating to the roads, and the conditions of the grants in respect of the use of the roads for the transportation of the troops and property of the United States.

3. Table No. 2 contains a list of all the railways named in Table No. 1, to which the grants were made on condition that the companies owning or operating the roads should transport the troops and property of the United States over said roads free of cost, charge, or expense to the United States.

4. Table No. 3 contains a list of all the railroads named in Table No. 1, to which the grants were made on the condition that "said railroad shall be and remain a public highway for the use of the Government of the United States, free from toll or other charge upon the transportation of any property or troops of the United States," and to which payment for such transportation is forbidden by the act of March 3, 1875, in the following words, to wit: "Provided, That no money shall hereafter be paid to any railroad company for the transportation of any property or troops of the United States over any railroad which, in whole or in part, was constructed by the aid of a grant

of public land on the condition that such railroad should be a public highway for the use of the Government of the United States, free from toll or other charge, or upon any other conditions, for the use of such road for such transportation; nor shall any allowance be made for the transportation of officers of the Army over any such road when on duty and under orders as military officers of the United States. But nothing herein contained shall be construed as preventing any such railroad from bringing a suit in the Court of Claims for the charges of such transportation, and recovering for the same if found entitled thereto by virtue of the laws in force prior to the passage of this act: *Provided*, That the claim for such charges shall not have been barred by the statute of limitations at the time of bringing the suit; and either party shall have the right of appeal to the Supreme Court of the United States: *And provided further*, That the foregoing provisions shall not apply for the current fiscal year, nor thereafter, to roads where the sole condition of transportation is that the company shall not charge the government higher rates than they do individuals for like transportation, and when the Quartermaster-General shall be satisfied that this condition has been faithfully complied with."

NOTE.—The Supreme Court, in the cases of the Atchison, Topeka and Santa Fé and the Lake Superior and Mississippi (now the Saint Paul and Duluth) Railroads, decided, and that decision applies with equal force to all the railroads named in Table No. 3, "that the reservation in question secures to the government only a free use of the railroads concerned" (not the equipment, rolling stock, &c.), "and that it does not entitle the government to have its troops and property transported by the company over their respective railroads free of charge for transporting the same." * * * "That the companies are entitled to compensation for all transportation performed by them, respectively, of troops and property of the government, subject to a fair deduction for the use of their respective railroads." But notwithstanding this decision the Quartermaster's Department cannot pay for the transportation of any property or troops of the United States over any of the railroads named in Table No. 3, so long as the provisions of the act of March 3, 1875, above quoted, remain unrepealed or unaltered.

5. Table No. 4 contains a list of all the railroads named in Table No. 1, to which grants of lands or bonds were made, but upon conditions which, in one way or another, permit full compensation to be made for all transportation services rendered by the companies owning or operating the roads. The compensation due from time to time to the Pacific railroad companies, to which bonds of the United States were loaned (see Table 5), is, however, withheld and applied by the Secretary of the Treasury in liquidating the interest and principal of said bonds.

6. Table No. 5 contains a separate list of the bonded Pacific railroads and their leased and operated lines. The compensation due from time to time to these Pacific railroads is withheld and applied, as above stated, under the acts of July 1, 1862, July 2, 1864, March 3, 1873, and May 7, 1878; but the compensation due for transportation over their leased and operated lines is withheld in pursuance of the opinion of the Attorney-General of February 24, 1874, and opinion of June 18, 1880, hereto appended.

7. In order that the requirements of the laws in respect of these land-grant and bonded railroads may be observed and fully complied with, officers of the Quartermaster's Department, in providing transportation, will for convenience in settling accounts of these railroads, issue separate requests and separate bills of lading to each of the bonded Pacific railroads for all transportation required over them. The practice of issuing separate requests and separate bills of lading for all transportation over the Omaha bridge, when service over other portions of the Union Pacific Railroad is involved, will be discontinued.

8. Separate requests and separate bills of lading will be issued for all transportation required over the land-grant railroads which are required by law to transport the troops and property of the United States over said railroads free of cost, charge, or expense to the United States (see Table No. 2), and for all transportation required over the railroads to which payment for the transportation is forbidden by the act of March 3, 1875 (see Table No. 3), except in cases provided for in the next succeeding paragraph.

9. When transportation for passengers or freight is required over two or more railroads (whether land-grant or not), forming a through line, or where arrangements have been made for through transportation at through rates, a single request or single bill of lading will be issued therefor in all cases where practicable, except as provided in paragraphs 7 and 8.

10. Whenever transportation is required over a land-grant railroad subject to any of the conditions, restrictions, or provisions of law named in paragraphs 3 and 4 of this order, the initial letters or full name of the land-grant road, the fact that it is a land-grant road and is required by law to transport the troops and property of the United States free of cost, charge, or expense to the United States, or that payment for the transportation is forbidden by law, will be stated on the request or bill of lading issued for the service.

11. In cases where it is not practicable to procure the necessary transportation on a single bill of lading over several railroads forming a through line and having a through rate, separate requests and separate bills of lading may be issued to the several portions of the through line; but officers will be particular to state in each request and bill of lading so issued, whether to land-grant or bonded railroads, or otherwise, the points of original departure and final destination of the persons or stores to be transported; and officers settling accounts for such service will be particular to note the points of original departure and ultimate destination, as stated in the request or bill of lading, and will only allow each road its proportion of such through rate, it being understood that the authority to issue separate requests and separate bills of lading in such cases, is given merely to facilitate settlement with all the roads for the services rendered. The government does not in any manner derive any benefit therefrom; and the fact that separate requests and separate bills of lading are issued in such cases, does not entitle any of the roads to local rates when through rates exist, the government being at all times legally and justly entitled to the lowest rates offered the public for similar service.

12. Whenever circumstances render necessary the issue of separate requests and separate bills of lading to each of several roads forming a through line and having a through rate, or where special rates have been secured for the transportation, the proportion of the through or special rate inuring to each road, land-grant or otherwise, will, when known, be stated on each request or bill of lading so issued.

13. Special rates will not be accepted for transportation over a line of roads any one of which is a land-grant road and subject to the conditions and provisions of law named in paragraphs 3 and 4 of this order, unless the rates offered are lower than the regular tariff rates with all land-grant deductions. When such rates are offered, it should be specifically stated in the proposition that the proportion inuring to the land-grant road (which should be definitely fixed and stated) has been deducted, and that the rate proffered is payable for the service over the remaining portion of the route exclusively. Any proposition that does not conform to the requirements of this paragraph will not be accepted.

14. Under the authority given in paragraph 54 of General Orders No. 98, A. G. O., of 1872, to purchase tickets when transportation is required from one part of the country to another, officers are instructed not to purchase tickets for transportation over any of the bonded Pacific railroads, nor over any of the land-grant roads named in Tables Nos. 2 and 3, appended to this order.

15. Payment will not be made for the transportation of any property or troops of the United States over any of the railroads named in Tables Nos. 2 and 3. Accounts for transportation over such railroads exclusively, if presented for payment, will be returned to the person presenting them, with a statement of the reasons why payment cannot be made for the service.

16. Officers settling accounts which include transportation over such land-grant roads, and over other roads to which payment is not forbidden by law, will withhold payment of the amount inuring to the land-grant road, deducting the same on the voucher at the time of making settlement, and will issue a certificate for that amount, in duplicate, as follows:

No.—

I certify that in settlement with the ——— (name the R. R. Co.) ——— Railroad Company for ——— (passenger or freight) ——— transportation, voucher No. —, Abstract B, of my disbursing accounts for ———, 18—, I withheld the sum of ——— dollars and ——— cents, it being the amount inuring on that settlement to the ——— (name the land-grant road) ——— Railroad Company for transportation over its road, as per sub-vouchers, Nos. —, attached to said voucher.

The said ——— (name the road) ——— is a land-grant railroad, and is required by law to transport the troops and property of the United States free of cost, charge, or expense to the United States; therefore payment of the amount withheld will not be made.

The transportation was performed in the following-named months, to wit:

——, 18—, \$——; ———, 18—, \$——.
 ——, 18—, \$——; ———, 18—, \$——.
 ——, 18—, \$——; ———, 18—, \$——.

Quartermaster, U. S. A.

(Original.)

If the amount is withheld because payment thereof is forbidden by law, in lieu of the words "and is required by law to transport the troops and property of the United States, free of cost, charge, or expense to the United States," &c., say "and payment of the amount withheld is forbidden by law."

NOTE.—In stating the date on which the transportation was furnished, be governed by the date of the certificate on the request of the party transported, and by the certifi-

cate of shipment in the bill of lading; and in giving the amount withheld give only the amount for services over the land grant road, and not the full amount represented by the voucher. The certificate can be used in settling accounts which include transportation over the bonded Pacific railroads by making the necessary alterations.

17. The original of this certificate will be sent to the company operating the land-grant road over which the transportation covered by the certificate was furnished, and will be accepted by the government as evidence of service rendered, in place of the original request or bill of lading; the duplicate of the certificate will be given to the railroad company with which settlement is made, for use in settlement with its connecting lines.

18. Payment may be made to any land-grant railroad company for transportation over any other road not land-grant, or to which payment is not forbidden by law or regulations, when the land-grant company is, in the ordinary course of business, entitled to collect the freight or passage money. Payment may also be made to any land-grant railroad company for transportation over any portion of its road, or branch roads, or leased or operated lines, to which payment is not forbidden by law or regulations.

19. In conformity to the decision of the Second Comptroller of the Treasury of July 28, 1874, authority is given for the reimbursement of the actual cost of transportation over the land-grant roads named in Tables Nos. 2 and 3, of persons not of the Army (civilians hired) holding appointment or employment under the United States, when on duty and traveling under orders at government expense, whenever it is impracticable to furnish such persons with the necessary transportation request.

20. In settlement of accounts for transportation over a railroad or line of railroads controlled and operated by one company, even though composed by the consolidation, lease, or otherwise, of several roads, a part only of which is land grant and subject to the conditions named in paragraphs 3 and 4 of this order, the amount to be withheld on account of land grant (for which certificate is to be issued), and the amount to be paid for the transportation over that portion of the road not subject to any of said conditions, will be apportioned according to their respective distances, the rate for the whole distance the troops or stores are carried being the rate at which settlement will be made; and in no case arising under this paragraph will a certificate be issued for a greater amount than the amount due on a strictly mileage basis.

21. For transportation at through rates over a line of roads controlled and operated by several companies, one or more of which is a land-grant road and subject to the conditions named in paragraphs 3 and 4, the amount to be withheld on account of the land-grant road will be the proportion (agreed upon by the companies operating the several roads) inuring to the land-grant road, which proportion should be ascertained by the officers before settlement of the account is made. If railroad companies refuse to state the proportions agreed upon, the amount withheld will be apportioned on a mileage basis, and the reasons why it was so apportioned will be stated on the voucher.

22. Accounts for transportation over the bonded Pacific railroads, including the Omaha bridge, and all lines owned, leased, or controlled by said Pacific railroads, will be presented for adjustment to the quartermasters designated for that duty, who will forward them, properly prepared and certified, to the Quartermaster-General for examination and reference to the accounting officers of the Treasury. No payments will be made by officers of the Army for transportation of any kind over these roads.

23. In settlement of accounts which include transportation over these Pacific railroads, and over other railroads to which payment for the service is not forbidden by law or regulations, officers will issue the certificate provided in paragraph 16, for the full amount inuring to the Pacific railroad, the several copies of which will be disposed of in the manner required by paragraph 17. The certificate will show that the road is a bonded road, and that payment of the amount is withheld in pursuance of regulations which require settlement for the service to be made by the Treasury Department.

By command of General Sherman :

R. C. DRUM,
Adjutant-General.

Official :

Assistant Adjutant-General.

POST-OFFICE DEPARTMENT.

Rates of pay for communications by telegraph, 1871-72.

Whereas, by the act of Congress, approved July twenty-fourth, A. D. eighteen hundred and sixty-six, entitled "An act to aid in the construction of telegraph lines, and to secure to the government the use of the same for postal, military, and other purposes," in section second it is enacted: That telegraphic communications between the several departments of the Government of the United States and their officers and agents

shall, in their transmission over the lines of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster-General:

Now, therefore, in pursuance and by virtue of the authority on me by said act conferred, I, J. A. J. Creswell, Postmaster General of the United States, do hereby fix the rates at which the telegraphic communications aforesaid shall be sent, for the year commencing on the first day of July, A. D. eighteen hundred and seventy-one, as follows, namely:

The rate for all telegraphic communications known as the signal service messages and reports, shall be two cents for each word of said reports and messages for each circuit over which it may pass in accordance with the schedule of circuits and plans of the Chief Signal Officer of the Army, which are now adopted or may hereafter be adopted by him for transmitting these dispatches, or such part thereof as he may designate in such words or ciphers as may, from time to time, be directed by him. The amount thus estimated is to be taken in full payment for said dispatches, no additional allowance to be made for drops, office messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said signal service messages and reports.

The rate for all telegraphic communications aforesaid, other than the said signal service messages and reports, shall be as follows, viz: one cent per word for each circuit* through which it shall be transmitted, said rate to be computed subject to the following conditions, viz:

A distance of two hundred and fifty miles, as computed by the tables of the Post-Office Department, shall be deemed a circuit.

If, on computing circuits, there shall be found one or more circuits and a fraction of a circuit, such fraction shall be deemed a circuit.

If a communication shall be sent a distance less than two hundred and fifty miles, that distance shall be deemed a circuit.

All words of the communication transmitted are to be counted, excepting the date and place at which such communication is filed; no communication to be at a rate less than twenty-five cents.

JNO. A. J. CRESWELL,
Postmaster-General.

JUNE 29, 1871.

Rates of pay for communications by telegraph, 1877-78.

POST-OFFICE DEPARTMENT, June 30, 1877.

Whereas, by the act of Congress approved July twenty-fourth, A. D. eighteen hundred and sixty-six, entitled "An act to aid in the construction of telegraph lines, and to secure to the government the use of the same for postal, military, and other purposes," in section second it is enacted: That telegraphic communications between the several departments of the Government of the United States and their officers and agents shall, in their transmission over the lines of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster-General:

Now, therefore, in pursuance and by virtue of the authority on me by said act conferred, I, David M. Key, Postmaster-General of the United States, do hereby fix the rates at which the telegraphic communications aforesaid shall be sent for the year commencing on the first day of July, A. D. eighteen hundred and seventy-seven, as follows, namely:

The rate for all telegraphic communications, sent otherwise than over circuits established by the Chief Signal Officer of the Army for the transmission of enciphered weather reports, shall be as follows, viz:

One cent per word for each circuit through which it shall be transmitted, said rate to be computed subject to the following conditions, viz:

A distance of five hundred miles, as computed by the tables of the Post-Office Department, shall be deemed a circuit, and the shortest practicable route of the company transmitting the message shall in all cases be the basis of computation.

If, in computing circuits, there shall be found one or more circuits and a fraction of a circuit, such fraction shall be deemed a circuit.

If a communication shall be sent a distance less than five hundred miles, that distance shall be deemed a circuit.

* The word circuit means, not a telegraphic circuit, but a unit of distance of two hundred and fifty miles.

† The word "circuit," as here used, means not a telegraphic circuit, but a unit of distance of five hundred miles.

All words of the communication transmitted are to be counted, excepting the date and place at which such communication is filed.

All messages of less than twenty-five words, address and signature included, shall be rated as if containing twenty-five words, and all messages exceeding twenty-five words shall be rated by the exact number of words they contain, address and signature included.

The rate for all telegraphic communications known as the Signal Service weather reports shall not exceed three cents for each word of said reports for each circuit over which they may pass, in accordance with the schedule of circuits and plans of the Chief Signal Officer of the Army, which are now or may hereafter be adopted by him for transmitting these reports, or such parts thereof as he may designate, in such words or ciphers as may, from time to time, be directed by him. The amount thus estimated is to be taken in full payment for said reports; no additional allowance to be made for drops, office messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said Signal Service reports.

If, at any time, from competition or other cause, telegraph rates shall be reduced so that a message of ten words may be sent for the public at a less rate than that above mentioned for a twenty-five word message, then, and in that case, this order shall be changed to meet such lower public rate; it being intended by this proviso that in no case shall the government be compelled to pay more for a twenty-five word message, including address and signature, than the public is required to pay for a ten-word message, exclusive of such address and signature.

DAVID M. KEY,
Postmaster-General.

Rates of pay for communications by telegraph.

POST-OFFICE DEPARTMENT,
Washington, D. C., June 30, 1880.

Whereas, by the act of Congress approved July 24, A. D. 1866, entitled "An act to aid in the construction of telegraph lines, and to secure to the government the use of the same for postal, military, and other purposes," in section second it is enacted that telegraphic communications between the several departments of the Government of the United States and their officers and agents shall, in their transmission over the lines of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster-General:

Now, therefore, in pursuance and by virtue of the authority on me by said act conferred, I, James N. Tyner, Acting Postmaster-General of the United States, do hereby fix the rates at which the telegraph communications aforesaid shall be sent for the year commencing July 1, A. D. 1880, as follows, namely:

The rate for all telegraphic communications, sent otherwise than over circuits established by the Chief Signal Officer of the Army for the transmission of enciphered weather reports, shall be as follows, viz:

One cent per word for each circuit through which it shall be transmitted, said rate to be computed subject to the following conditions, viz:

A distance of five hundred miles, as computed by the topographer of the Post-Office Department, shall be deemed a circuit, and the shortest practicable route of the company transmitting the message shall in the cases be the basis of computation.

If, in computing circuits, there shall be found one or more circuits and a fraction of a circuit, such fraction shall be deemed a circuit.

If a communication shall be sent a distance less than 500 miles, that distance shall be deemed a circuit.

All words of the communication transmitted are to be counted, excepting the date and place at which such communication is filed.

All messages of less than twenty-five words, address and signature included, shall be rated as if containing twenty-five words, and all messages exceeding twenty-five words shall be rated by the exact number of words they contain, address and signature included.

Each company will be allowed to charge for messages received from another line at the same rates as if received from the government direct for transmission over its own line.

Companies forwarding messages to another line will be entitled to compensation at established rates to the terminus of their lines, at the same rates as if for messages transmitted exclusively over their own lines.

The rate for all telegraphic communications known as the Signal Service weather reports shall not exceed three cents for each word of said report for each circuit over which they may pass, in accordance with the schedule of circuits and plans of the

Chief Signal Officer of the Army, which are now or may hereafter be adopted by him for transmitting these reports, or such parts thereof as he may designate, in such words or ciphers as may from time to time be directed by him. The amount thus estimated is to be taken in full payment for said reports; no additional allowance to be made for drops, office messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said Signal Service reports.

If, at any time, from competition or other cause, telegraph rates should be reduced so that a message of ten words may be sent for the public at a less rate than that above mentioned for a twenty-five word message, then, and in that case, this order shall be changed to meet such lower public rate; it being intended by this proviso that in no case shall the government be compelled to pay more for a twenty-five-word message, including address and signature, than the public is required to pay for a ten-word message, exclusive of such address and signature.

All officers of the United States Government should indorse upon official messages transmitted by them the words "Official Business," and should report to the Postmaster-General any charges in excess of the above rates.

JAMES N. TYNER,
Acting Postmaster-General.

Telegraph companies subject to the provisions of this order.

The following is a list of telegraph companies that have filed acceptances of the provisions of the preceding sections of this title up to the 1st day of June, 1880:

1. The National Telegraph Company, of New York, N. Y.
2. The Globe Insulated Lines Telegraph Company, of New York.
3. The American Submarine Telegraph Company, of New York, N. Y.
4. International Telegraph Company, of Portland, Me.
5. The Atlantic and Pacific Telegraph Company, of New York, N. Y.
6. The Franco-American Land and Ocean Telegraph Company, of New York, N. Y.
7. The Globe Telegraph Company, of New York.
8. Mississippi Valley National Telegraph Company, of Saint Louis, Mo.
9. Western Union Telegraph Company, of New York.
10. Northwestern Telegraph Company, of Kenosha, Wis.
11. Great Western Telegraph Company, of New York.
12. The Franklin Telegraph Company, of Boston, Mass.
13. The Insulated Lines Telegraph Company, Boston, Mass.
14. Pacific and Atlantic Telegraph Company, of Pittsburgh, Pa.
15. The Atlantic and Pacific States Telegraph Company, of Sacramento, Cal.
16. The Marine and Inland Telegraph Company, of New Jersey, 715 Locust street, Philadelphia.
17. The Eastern Telegraph Company, of Philadelphia, Pa.
18. The Delaware River Telegraph Company, Philadelphia, Pa.
19. Peninsula Telegraph Company, New York City.
20. Cape May and Shore Telegraph Company, New York City.
21. Ocean Telegraph Company, of Boston, Mass.
22. The American Cable Company, of New York.
23. Southern and Atlantic Telegraph Company, of Philadelphia, Pa.
24. Interpational Ocean Telegraph Company, New York City.
25. Missouri River Telegraph Company, of Sioux City, Iowa.
26. Atlantic and Pacific Telegraph Company, of Missouri. Executive office 145 Broadway, New York City. Received and filed May 8, 1877.
27. New Jersey and New England Telegraph Company. Received and filed November 21, 1878. Address A. L. Worthington, No. 10 Green street, Trenton, N. J.
28. Central Union Telegraph Company, 145 Broadway, New York. Received and filed May 9, 1879.
29. New York Land and Ocean Telegraph Company. Received and filed May 10, 1879.
30. Deseret Telegraph Company, Salt Lake City, Utah. Received and filed May 19, 1879.
31. American Union Telegraph Company of New York, 145 Broadway, New York. Received and filed June 28, 1879.
32. The American Rapid Telegraph Company, 41 Wall street, New York. Received and filed April 12, 1879.
33. Wabash Railway Company, Cyrus W. Field, president, New York. Received and filed July 11, 1879.
34. The American Union Telegraph Company of Missouri, Chas. S. Greeley, president, Saint Louis, Mo. Received and filed July 9, 1879.
35. The Baltimore and Ohio Railroad Company of Maryland, John W. Garrett, president, Baltimore, Md. Received and filed July 18, 1879.
36. The American Union Telegraph Company of New Jersey, D. H. Bates, president, Jersey City, N. J. Received and filed July 17, 1879.

37. The American Union Telegraph Company of Baltimore City, Md. Received and filed July 31, 1879.
38. The Deer Lodge Telegraph Company of Butte City, Mont. Received and filed August 30, 1879.
39. The American Union Telegraph Company of Pennsylvania, D. H. Bates, president, Philadelphia. Received and filed September 4, 1879.
40. The American Union Telegraph Company of Indiana, La Fayette, Ind. Received and filed September 12, 1879.
41. The Cheyenne and Black Hills Telegraph Company, W. H. Hibbard, superintendent, Cheyenne, Wyo. Received and filed November 7, 1879.
42. The American Union Telegraph Company of Ohio, Frank B. Swayne, president, Toledo, Ohio. Received and filed November 8, 1879.
43. The American Union Telegraph Company of Louisiana, Ed. Leloup, secretary, New Orleans, La. Received and filed March 1, 1880.

APPENDIX E.

FORMS OF REPORT REQUIRED.

FORM No. 8-001.—Debit and credit footings of every account in the general ledger. Monthly,

FORM No. 8-002.—Condition and operation, financial and statistical. Semi-annually.

FORM No. 8-003.—Comparative statement for present and previous year, showing earnings and expenses, and number of miles operated. Monthly.

FORM NO. 9-001.

OFFICE OF AUDITOR OF RAILROAD ACCOUNTS, INTERIOR DEPARTMENT, WASHINGTON, D. C.

Abstract of the debit and credit footings of the general ledger of the ——— Railroad Company, at the close of business on ———, 188—.

LEDGER PAGE OR FOLIO.	TITLES (OR NAMES) OF ACCOUNTS.		DEBIT FOOTINGS.	CREDIT FOOTINGS.		
	<p style="text-align: right;">Date and sign the last sheet.</p> <p style="text-align: right;">Amounts carried forward.....</p>					

Report of the ——— rail ——— company to the Auditor of Railroad Accounts, Department of the Interior, Washington, D. C., for the half-year ending ———, 18—.

[Extracts from an act of Congress entitled "An act to create an Auditor of Railroad Accounts, and for other purposes," approved June 19, 1878.]

* * * * *

SEC. 3. That the duties of the said Auditor, under and subject to the direction of the Secretary of the Interior, shall be, to prescribe a system of reports to be rendered to him by the railroad companies whose roads are in whole or in part west, north, or south of the Missouri River, and to which the United States have granted any loan of credit or subsidy in bonds or lands.

* * * * *

SEC. 4. That each and every railroad company aforesaid which has received from the United States any bonds of the said United States, issued by way of loan to aid in constructing or furnishing its road, or which has received from the United States any lands granted to it for a similar purpose, shall make to the said Auditor any and all such reports as he may require from time to time, and shall submit its books and records to the inspection of said Auditor or any person acting in his place and stead, at any time that the said Auditor may request, in the office where said books and records are usually kept; and the said Auditor, or his authorized representative, shall make such transcripts from the said books and records as he may desire.

SEC. 5. That if any railroad company aforesaid shall neglect or refuse to make such reports as may be called for, or refuse to submit its books and records to inspection, as provided in section four of this act, such neglect or refusal shall operate as a forfeiture, in each case of such neglect or refusal, of a sum not less than one thousand nor more than five thousand dollars, to be recovered by the Attorney-General of the United States in the name and for the use and benefit of the United States; and it shall be the duty of the Secretary of the Interior, in all such cases of neglect or refusal as aforesaid, to inform the Attorney-General of the facts, to the end that such forfeiture or forfeitures may be judicially enforced.

SEC. 6. This act shall apply to any and all persons or corporations into whose hands either of said railroads may lawfully come, as well as to the original companies.

SEC. 7. This act shall take effect on and after the first day of July, anno Domini eighteen hundred and seventy-eight.

TITLE, HISTORY, ADDRESSES, &C., OF COMPANY.

Corporate name, or title:

Date of incorporation:

Previous name, or names:

Date of opening entire main line to public business:

With what other companies consolidated, and dates of consolidation:

Length and termini of projected road:

Termini of main line and of branches as constructed:

Location of principal business office (where stockholders and directors meet):

Location of offices for transfer of stock:

Location of offices for payment of interest:

Location of general business or operating office:

Present number of stockholders:

Date of annual meeting for election of directors:

Dates of regular meetings of directors:

Date of close of company's fiscal year:

OFFICERS AND DIRECTORS.

OFFICERS.

Name.	Title.	Post-office address.
	President.....	
	Vice-President.....	
	Receiver.....	
	Secretary.....	
	Treasurer.....	
	Auditor.....	
	General superintendent.....	
	Chief engineer.....	
	General passenger agent.....	
	General freight agent.....	
	Superintendent express.....	
	Superintendent telegraph.....	
	Stock transfer agent.....	
	Land commissioner.....	
	Attorney.....	

DIRECTORS.

Name.	Post-office address.	Expiration of term.	Stock, shares of
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18
			18

ADDITIONS AND BETTERMENTS TO RAILWAY, ETC.

ITEM.	CHARGED TO CONSTRUCTION ACCOUNT.				CHARGED TO OPERATING EXPENSES.			
Right of way								
Land damage								
Land and fencing								
Grading and ditching								
Masonry and ripraping								
Rails, iron								
Rails, steel								
Spikes, joint fastenings, and other iron in track								
Cross-ties								
Track laying								
Bridging, piling, and trestling								
Ballast								
Passenger buildings, hotels, and furniture								
Freight buildings and warehouses								
Combination (freight and passenger) buildings								
Grain-elevators								
Machine-shops and car-shops								
Machinery and tools								
Engine-houses and turn-tables								
Water-tanks, tank buildings, and apparatus								
Other buildings and structures								
Engineering, agencies, and executive expenses								
Interest, discount, commissions, &c								
Road built by contract								
do. miles								
Purchase of constructed road								
do. miles								
Telegraph								
Total								Total, \$

Assessed valuation of roadway, bridges, track, buildings, &c., for taxation, average per mile, \$

ADDITIONS AND BETTERMENTS TO ROLLING STOCK.

ITEM.	CHARGED TO EQUIPMENT ACCOUNT.				CHARGED TO OPERATING EXPENSES.			
Locomotives—four-driver.....								
Locomotives—six-driver.....								
Locomotives.....								
Cars—passenger—first-class.....								
Cars—passenger—second-class.....								
Cars—passenger—emigrant.....								
Cars—sleeping, dining, and parlor.....								
Cars—officers', directors', pay, &c.....								
Cars—baggage.....								
Cars—express.....								
Cars—mail.....								
Cars—combination.....								
Cars—freight—box.....								
Cars—freight—platform.....								
Cars—coal.....								
Cars—stock.....								
Cars—hay.....								
Cars—caboose.....								
Cars—dump or gravel.....								
Cars—section or push.....								
Cars—hand.....								
Cars—wrecking.....								
Cars—derrick.....								
Snow-plows and sweepers.....								
Ice-flangers.....								
Steam plows and shovels.....								
Total.....								

Assessed valuation of all rolling stock and equipment for taxation, \$

OPERATING EXPENSES—Continued.

CLASSIFICATION.	DISTRIBUTED AS PER ACCOUNTS KEPT.		DISTRIBUTION NOT ASCERTAINED.	TOTAL.
	Passenger.	Freight.		
Maintenance of roadway and buildings: To include road-masters, foremen, clerks, mechanics, laborers, and watchmen; stationery and printing; cross-ties; ballast; expenses of road-trains (engineers, firemen, fuel, oil, tallow, waste, &c.); removing snow and ice; fuel and light; repairs of bridges, road-bed, snow sheds and galleries, snow-fences, shops, engine-houses, turn-tables, station-buildings, section-houses, fuel and water stations, culverts, tunnels, road-cars, telegraph, tools, &c.				
Maintenance of track: To include iron and steel rails, joint-fastenings, spikes, frogs, and switches; labor repairing track; tools; incidental expenses, &c.				
Motive power: To include engineers, firemen, wipers, and shop foremen; fuel and light for machine shops; stationery and printing; oil, tallow, waste, and packing for engines; rent of engines; repairs of engines and shop machinery; patterns and tools; incidental expenses, &c.				
Fuel and water for locomotives: To include coal and wood; laborers and watchmen at fuel and water stations; incidental expenses, &c.				
Maintenance of cars: To include repairs of cars (revenue), of car-shop machinery, and of tools; fuel and light for car-shop; foremen of car-shops; incidental expenses of car-shops and cars, &c.				
Administration and general expenses: To include general officers, division superintendents, clerks, and attendants; stationery and printing; furniture; fuel and light; rent and office expenses; general advertising; foreign agencies; legal expenses; extraordinary repairs; incidentals, &c.				
Taxes: National, State, county, and city				
Insurance and losses by fire:				
On general offices, station buildings, shops, &c.				
Rental of leased lines:				
Total				

OPERATIONS OF THE LAND DEPARTMENT—FINANCIAL.

RECEIPTS.	CONGRESSIONAL LANDS.	ALL LANDS.	EXPENSES.	CONGRESSIONAL LANDS.	ALL LANDS.
From all cash sales of lands.....			Salaries.....		
From first payment on time sales			Advertising.....		
during half year.....			Stationery and printing.....		
From principal on previous time			Conveyancing.....		
sales.....			Office expenses.....		
From interest on time sales.....			Taxes, State.....		
From all cash sales of town lots.....			Taxes, county.....		
From first payments on time sales			Taxes, municipal.....		
of town lots.....					
From principal on previous time					
sales of town lots.....					
From interest on sales of town lots					
Total.....			Total.....		
Total receipts from all sales to date.....			Outstanding on account of time sales, principal.....		
Average price per acre for all sales to date.....			Outstanding on account of time sales, interest.....		
Average price per acre for all sales during half-year.....			Outstanding on account of time sales, total.....		
Average price per acre for all purchases to date.....					
Maximum price per acre from sales (not town lots).....					
Minimum price per acre from sales (not town lots).....					
Maximum price per acre now asked (not town lots).....					
Minimum price per acre now asked (not town lots).....					
Average price per acre now asked (not town lots).....					

REVENUE AND EXPENDITURES.

REVENUE.	AMOUNT.	EXPENDITURES.	AMOUNT.
Earnings..... Profits on stocks of other companies..... Profits on bonds of other companies..... Dividends on stocks of other companies..... Interest on stocks of other companies..... Profits on bonds of other companies..... Profits on miscellaneous investments..... Interest on miscellaneous investments..... Receipts of the land department.....		Operating expenses..... Interest on first-mortgage bonds..... Interest on other funded debt..... Interest on other debt..... Leases on stocks of other companies..... Leases on bonds of other companies..... Leases on miscellaneous investments..... Sinking-fund requirements—company..... New construction..... Dividends..... Expenses of the land department..... One-half of compensation retained by United States..... Five per centum of net earnings paid to United States..... United States sinking-fund requirement.....	
Total.....		Total.....	

GENERAL BALANCE SHEET AT CLOSING OF ACCOUNTS, ——— 18—

LIABILITIES.	AMOUNT.	ASSETS.	AMOUNT.
First-mortgage bonds..... Interest on first-mortgage bonds..... United States subsidy bonds..... Interest on United States bonds, due and unpaid..... Interest on United States bonds, accrued—not yet due..... Other funded debt..... Interest on other funded debt, due and unpaid..... Interest on other funded debt, accrued—not yet due..... Dividends unpaid..... Bills payable..... Pay rolls and vouchers..... Due other companies on account of traffic..... Due other companies on account of leases..... Accounts payable..... Profit and loss (balance of undivided income)..... Capital stock.....		Road and fixtures..... Equipment..... Real estate other than road..... Granted lands not sold (estimated at per acre) Fuel, material, and stores on hand..... Cash..... Company's stock and bonds owned by company..... Other stocks and bonds..... Miscellaneous investments..... Due from the United States..... Sinking fund in hands of trustees..... Sinking fund in United States Treasury..... Bills receivable..... Due from other companies on account of traffic..... Due from other companies on account of leases..... Accounts receivable..... Bad debts, or suspense accounts..... Profit and loss (balance or net loss to date).....	
Total.....		Total.....	

TRAFFIC AND MILEAGE STATISTICS—PASSENGER.

ITEM.	WARD BOUND.			IN BOTH DIRECTIONS.		
	Through.	Way.	Total.	Through.	Way.	Total.
Passengers carried:						
Government.....						
(Commercial)—First-class.....						
Second-class.....						
Emigrant.....						
Commutation.....						
Ferry.....						
Free.....						
Total.....						
Carried one mile:						
Government.....						
(Commercial)—First-class.....						
Second-class.....						
Emigrant.....						
Commutation.....						
Ferry.....						
Free.....						
Total.....						
Miscellaneous:						
Trains run, number of.....						
Trains run one mile.....						
Cars run (a), number of.....						
Cars run one mile (a).....						
Tons mail carried.....						
Tons mail carried one mile.....						
Tons extra baggage carried.....						
Tons extra baggage carried one mile.....						
Tons express carried.....						
Tons express carried one mile.....						
Locomotive mileage.....						

(a) Including mail, baggage, and express cars.—N. B. The number and mileage of mixed trains should be apportioned to "passenger" and "freight," according to gross weight of cars.

TRAFFIC AND MILEAGE STATISTICS—FREIGHT.

IN BOTH DIRECTIONS.

—WARD BOUND.

—WARD BOUND.

ITEM.

Total.

Way.

Through.

Total.

Way.

Through.

Total.

Way.

Through.

Total.

Way.

Through.

Total.

Tons carried:

(Government

Commercial—Coal

Other

Company—Coal

Other

Free

Total

Tons carried one mile:

(Government

Commercial—Coal

Other

Company—Coal

Other

Free

Total

Miscellaneous:

Trains run (a), number of

Trains run one mile (a)

Cars (loaded) run (a)

Cars (loaded) run one mile (a)

Cars (empty) run (a)

Cars (empty) run one mile (a)

Coal cars (loaded) run

Coal cars (loaded) run one mile

Coal cars (empty) run

Coal cars (empty) run one mile

Coal trains run one mile

Locomotive mileage

(a) Other than coal.—N. B. The number and mileage of mixed trains should be apportioned to "passenger" and "freight," according to gross weight of cars.

FREIGHT CLASSIFICATION.

CLASS.	NUMBER OF TONS CARRIED.		
	— ward.	— ward.	Total.
1. Grain			
2. Flour			
3. Tobacco			
4. Hay			
5. Cotton			
6. Fruits			
7. Other farm products			
8. Live stock			
9. Groceries, provisions, poultry, game, and fish			
10. Salt			
11. Whisky and other liquors			
12. Machinery, including agricultural implements			
13. Wagons, carriages, carts, &c			
14. Stone, brick, lime, cement, sand, and clay			
15. Lumber and other forest products			
16. Furniture and undertakers' goods			
17. Coal, wood, coke, and charcoal			
18. Mineral products			
19. Stoves, tinware, hardware, and cutlery			
20. Glassware, queensware, and crockery			
21. Dry goods and clothing			
22. Drugs, chemicals, and paints			
23. Petroleum and other oils			
24. Powder and other explosives			
25. Miscellaneous			
Total			

FREIGHT CLASSIFICATION—SECOND FORM.

CLASS. (As per company's own classification.)	NUMBER OF TONS CARRIED.		
	ward.	ward.	Total
Total.....			

TARIFF IN FORCE AT CLOSE OF HALF YEAR.

CLASSIFICATION.	LOCAL.	THROUGH.	JOINT.	LOWEST ON SPECIAL CONTRACT.
FREIGHT:	<i>Average.</i>	<i>Average.</i>	<i>Average.</i>	
1st class, per ton per mile.....				
2d class, per ton per mile.....				
3d class, per ton per mile.....				
4th class, per ton per mile.....				
EXPRESS:				
PASSENGER:				
1st class, per passenger per mile.....				
2d class, per passenger per mile.....				
Emigrant, per passenger per mile.....				
Commutation, per passenger per mile....				
" " "				
sleeping car.....	per night.	per trip.		
Parlor car.....	per diem.	per trip.		
Chair car.....	per diem.	per trip.		

EXPRESS AND TRANSPORTATION COMPANIES, ETC.

Brief statement of all existing contracts and agreements with express companies:

Brief statement of all existing contracts and agreements with sleeping-car or dining-car companies:

Brief statement of all existing contracts and agreements with freight or transportation companies:

Brief statement of all existing contracts and agreements with other railroad companies, steamboat or steamship companies, or other companies or persons, concerning the transportation of freight or passengers:

Brief statement of the terms and conditions of all existing leases affecting this company (giving corporate names of parties), including all contingent liabilities and agreements for the use of track:

OPERATIONS OF THE LAND DEPARTMENT—STATISTICAL.

CONGRESSIONAL LANDS.

ACQUIRED.	During the half year, number of acres.	Total at close of the half year, number of acres.	DISPOSED OF.	During the half year, number of acres.	Total at close of the half year, number of acres.
By United States patent			For cash.....		
By patent of State of.....			On time contracts.....		
By			As town lots, for cash.....		
By			As town lots, on time contracts.....		
By					
By			Reclaimed by the United States		
By cancellation of contracts.....			Total.....		
Total.....					

MISCELLANEOUS LANDS.

ACQUIRED.	During the half year, number of acres.	Total at close of the half year, number of acres.	DISPOSED OF.	During the half year, number of acres.	Total at close of the half year, number of acres.
By purchase of			For cash.....		
By			On time contracts.....		
By			As town lots, for cash.....		
By			As town lots, on time contracts.....		
By					
By cancellation of contracts.....			Total		
Total.....					

CHARACTERISTICS OF ROAD.

TRACK.	MILES.				
	Owned.		Leased.	Total operated.	
	Constructed during half year.	At close of half year.			
Length of road, main line.....					
" extension lines.....					
" branch lines.....					
Total length of road.....					
Double track.....					
Side track.....					
Total length of track.....					
Laid with iron rail, American manufacture.					
" " steel rail, " " "					
" " iron rail, foreign " "					
" " steel rail, " " "					

GRADES.		Ascending ward.	Ascending ward.	Total.
Grades less than 10 feet per mile, length in miles.....				
" 10 to 20 feet per mile, " "				
" 20 to 30 " " " "				
" 30 to 40 " " " "				
" 40 to 50 " " " "				
" 50 to 60 " " " "				
" 60 to 70 " " " "				
" 70 to 80 " " " "				
" 80 to 90 " " " "				
" 90 to 100 " " " "				
" 100 to 110 " " " "				
" 110 to 120 " " " "				
" upwards of 120 feet per mile, " "				
Total grades, " "				
Level, " "				
Maximum grade, feet per mile.....				
Average " "				
Sum of ascents, in feet.....				

ALIGNMENT.

Curves of less than 1 degree.....	} Length in miles.	Curves of 8 degrees and upwards.....	} Length in miles.
" 1 degree and upwards.....		" 9 " " " "	
" 2 degrees " " " "		" 10 " " " "	
" 3 " " " " " "		Total curved line.....	
" 4 " " " " " "		Total straight line.....	
" 5 " " " " " "		Length of minimum radius, in feet.....	
" 6 " " " " " "		Degrees of curvature.....	
" 7 " " " " " "			

NOTE.—Changes from last report need only be entered.

CHARACTERISTICS—Concluded.

BRIDGES.	CONSTRUCTED DURING HALF-YEAR.			TOTAL AT CLOSE OF HALF-YEAR.		
	No. of spans or arches.	Longest span or arch, feet.	Aggregate length, feet.	No. of spans or arches.	Longest span or arch, feet.	Aggregate length, feet.
Stone						
Iron, suspension						
" truss						
" girder						
Combination, Howe truss						
Pratt						
Wood, Howe truss						
Pratt						
" girder (on masonry)						
" trestle						
" piling						
Total						

MISCELLANEOUS CHARACTERISTICS.

Bridges, total number	Fencing, miles
Draw-spans, "	Cattle-guards, number
Character of draw-signals	Crossings, railroad, at grade, number
Location of draw-signals (with reference to track)	" " above grade, number
Minimum distance of signal from draw	" " under grade, "
Culverts, open, number	" " highway, at grade, number
" box, "	" " above grade, number
" arch, "	" " under grade, "
" total number	Cross-ties, number per mile
" aggregate span, in feet	Track ballasted with stone, miles
Tunnels lined with wood, number	" " other material, miles
" " length in feet	Stations used jointly with other companies, number
" " brick, number	Stations used solely by this company, number
" " length in feet	Passenger buildings, number
" " stone, number	Hotels, number
" " length in feet	Boarding and tenement houses, number
" total number	Freight depots and warehouses, "
" aggregate length, in feet	Combination (freight and passenger) buildings, number
Longest tunnel, "	Grain elevators, number
Width of gauge of track	Water stations, "
Rail iron, maximum weight per yard, lbs	Fuel stations, "
" minimum	Engine-houses, "
" steel, maximum	Stalls in engine-houses, number
" minimum	Turn-tables, wrought-iron, number
Telegraph owned by company, miles of line	" cast-iron, "
Telegraph owned by company, miles of wire	" wooden, "
Telegraph stations operated by company, number	Machine-shops, number
Telegraph stations, total number on road	Car-shops, number
	Section or tool houses, number

DESCRIPTION OF ROLLING STOCK—NOT OWNED.

Locomotives.	Number added during half-year.	Total number at close of half-year.	Weight of heaviest locomotive, with fuel and water aboard, pounds.	Wheel base of heaviest locomotive, feet.	Weight of heaviest tender without fuel and water, pounds.	Wheel base of heaviest tender, feet.	Number of wheels under heaviest tender.	Capacity of heaviest tender.		Length of locomotive and tender coupling to coupling, feet.
								Water, gal. or coals.	Fuel, tons or coals.	
With 8 drivers.....										
With 6 drivers.....										
With 4 drivers.....										
Total.....										
Locomotives with train-brakes, number.....										
Kind of brake.....			8-driver locomotives,			6-driver locomotives,			4-driver locomotives,	
Cars.										
	Number added during half-year.	Total number at close of half-year.	Weight of heaviest car in pounds.	Number of wheels under heaviest car.	Length of heaviest car from coupling to coupling, feet.	Number of cars fitted with train-brake.	Number of cars fitted with coupler and platform.			
Passenger department:										
Parlor.....										
Hotel.....										
Sleeping.....										
Chair.....										
First-class.....										
Second-class.....										
Emigrant.....										
Mail.....										
Baggage.....										
Express.....										
Combination.....										
Total.....										
Freight department:										
Box.....										
Platform.....										
Stock.....										
Combination.....										

Coal, 8 wheel.....									
Coal, 4 wheel.....									
Caboose.....									
Total.....									
Road and miscellaneous:									
Officers', directors', pay, &c.....									
Dump, gravel, construction, &c.....									
Wrecking, snow-plows, sweepers, &c.....									
Hand.....									
Push.....									
Total.....									

MISCELLANEOUS STATISTICS.

[illegible]

TRAIN ACCIDENTS.

CLASSIFICATION.	No. during half-year.	CASUALTIES.				RESULTING EXPENSES.				
		No. of persons killed or fatally injured.	No. of persons injured, not fatally.	No. of locomotives damaged.	No. of cars damaged.	Repairs.	Loss and damage to freight.	Damage to persons.	Legal expenses.	Total expenses.
Boiler explosions										
Broken cylinder-head										
Broken connecting or parallel rod										
Broken eccentric-strap										
Broken wrist-pin										
Fire in cars while running										
Heated journals										
COLLISIONS:										
Butting										
Rear										
Railroad crossing										
Broken train										
Runaway car or locomotive										
DERAILMENTS:										
Defective joint										
Broken rail										
Defective frog										
Broken or defective switch-gear										
Misplaced switch										
Misplaced signal										
Spreading of rails										
Track up										
Broken tie										
Broken wheel										
Broken car										
Broken axle										
Broken coupling										
Broken truck										
Loose wheel										
Trucks out of gauge										
Broken or defective bridge-truss or girder										
Broken or defective lateral or diagonal bracing on bridge										
Defective bridge-door										
Open draw-bridge										
Stock on track										
Vehicles on track										
Accidental obstructions										
Malicious obstruction or interference										
Wind										
Snow and ice										
Washouts										
Land-slides										
Runaway cars										
Run off of dead-end of track										
Unexplained										
Total										

EMPLOYÉS.

CLASS.	NUMBER.	AVERAGE RATE OF PAY.	CHARACTER OF SERVICE.
General officers		\$ per annum.	Administrative.
Clerks		per annum.	In general offices.
Attendants			Do.
Superintendents of divisions			Administrative.
Clerks			In division superintendents' offices.
Attendants			Do.
Road-masters			In roadway department.
Foremen			Do.
Clerks			Do.
Laborers			Do.
Bridge superintendents			In bridge department.
Foremen			Do.
Mechanics			Do.
Laborers			Do.
Master mechanics			In machine-shops and car-shops.
Foremen			Do.
Clerks			Do.
Mechanics			Do.
Laborers			Do.
Station agents			At stations.
Clerks			Do.
Watchmen			Do.
Laborers			Do.
Switch-tenders			Do.
Baggage-masters			Do.
Baggage-masters' assistants			Do.
Yard-masters			Do.
Train-dispatchers			Do.
Telegraph-operators			Do.
Conductors, passenger			On trains.
Conductors, freight			Do.
Brakemen			Do.
Engineers			Do.
Firemen			Do.
Baggagemen			Do.
Laborers and watchmen			At fuel and water stations.
Patrols			On the road.
Watchmen			On bridges.
Engine-wipers			In engine-houses.
Car-cleaners			In car-sheds and yards.
Carpenters			On buildings.
Bricklayers			Do.
Plasterers			Do.
Roofers			Do.
Other employés			Do.

STATEMENT OF THE EARNINGS AND EXPENSES OF THE — RAIL — FOR — 18— AND 18—

EARNINGS.	18—		EXPENSES.		18—		18—	
Passenger			Conducting transportation					
Freight			Motive power					
Mail			Maintenance of cars					
Express			Maintenance of way					
Miscellaneous			General expenses and taxes					
Total			Total					
			Net earnings					

Miles of road operated, — in 18—, — in 18—
 Dated, —, 18 .

To the AUDITOR OF RAILROAD ACCOUNTS, Washington, D. C.

APPENDIX F.

Laws of the United States affecting Pacific Railroad: passed by the Forty-sixth Congress.

CONTENTS.

Subject.	Date of approval.	U. S. Statutes.	
		Vol.	Page.
Amendment of census act	Apr. 20, 1880	21	75
Authorizing railroad to be built through Fort Russell Reservation	May 17, 1880	21	141
Amendment of Revised Statutes regarding dutiable goods	June 10, 1880	21	173
Do	June 14, 1880	21	198
Appropriation for office of Auditor of Railroad Accounts	June 15, 1880	21	223
Appropriation for deficiency for incidental expenses	June 16, 1880	21	245

ACT OF APRIL 20, 1880.

21 Stat., 75. AN ACT to amend an act entitled "An act to provide for taking the tenth and subsequent censuses," approved March third, eighteen hundred and seventy-nine.

Sec. 17 amend- SEC. 3. That section seventeen of the act aforesaid be so amended as ed (20 Stat., 478). to allow the report which the Superintendent of the Census is required Fiscal year of to obtain from railroad corporations, incorporated express companies, corporations al- telegraph companies, and insurance companies to be made for the fiscal lowed to be re- year of the incorporation or company having its termination nearest to tentend of Cen- the first of June, eighteen hundred and eighty. sus.

ACT OF MAY 17, 1880.

21 Stat., 141. AN ACT to authorize the Wyoming, Montana and Pacific Railroad Company to build its road across the Fort Russell and Fort Laramie Military Reservation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Wyoming, Montana Line to be ap- and Pacific Railroad Company, a corporation organized under the laws proved by Secre- of the Territory of Wyoming, is hereby authorized to build its road tary of War. across the Fort Russell and Fort Laramie Military Reservations, upon Right of way such line as may be approved by the Secretary of War: *Provided,* Such 100 feet in width. right of way shall not exceed one hundred feet in width.

Approved May 17, 1880.

ACT OF JUNE 10, 1880.

21 Stat., 173. AN ACT to amend the statutes in relation to immediate transportation of dutiable goods, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when any merchandise, other than explosive articles, and articles in bulk not provided for in section four* of this act, imported at the ports of New York, Philadelphia, Boston, Baltimore, Portland and Bath, in Maine, Chicago, Port Huron, Detroit, New Orleans, Norfolk, Charleston, Savannah, Mobile, Galveston, Pensacola, Florida, Cleveland, Toledo, and San Francisco, shall appear

* Changed to "section five" by amendment of June 14, 1880. 21 Stat., 198.

by the invoice or bill of lading and manifest of the importing vessel to be consigned to and destined for either of the ports specified in the seventh section of this act, the collector at the port of arrival shall allow the said merchandise to be shipped immediately after the entry prescribed in section two of this act has been made.

SEC. 2. That the collector at the port of first arrival shall retain in his office a permanent record of such merchandise so to be forwarded to the port of destination, and such record shall consist of a copy of the invoice and an entry whereon the duties shall be estimated as closely as possible on the merchandise so shipped, but no oaths shall be required on the said entry. Such merchandise shall not be subject to appraisement and liquidation of duties at the port of first arrival, but shall undergo such examination as the Secretary of the Treasury shall deem necessary to verify the invoice; and the same examination and appraisement thereof shall be required and had at the port of destination as would have been required at the port of first arrival if such merchandise had been entered for consumption or warehouse at such port.

SEC. 3. That such merchandise shall be delivered to and transported by common carriers, to be designated for this purpose by the Secretary of the Treasury, and to and by none others; and such carriers shall be responsible to the United States as common carriers for the safe delivery of such merchandise to the collector at the port of its destination; and before any such carriers shall be permitted to receive and transport any such merchandise, they shall become bound to the United States in bonds of such form and amount, and with such conditions, not inconsistent with law, and such security as the Secretary of the Treasury shall require.

SEC. 4. That sections twenty-eight hundred and fifty-three and twenty-eight hundred and fifty-five of the Revised Statutes of the United States be, and the same are hereby, so amended as to require that all invoices of merchandise imported from any foreign country and intended to be transported without appraisement to any of the ports mentioned in the seventh section of this act, shall be made in quadruplicate; and that the consul, vice-consul, or commercial agent, to whom the same shall be produced, shall certify each of said quadruplicates under his hand and official seal in the manner required by section twenty-eight hundred and fifty-five of the Revised Statutes, and shall then deliver to the person producing the same two of the quadruplicates, one to be used in making entry at the port of first arrival of the merchandise in the United States, and one to be used in making entry at the port of destination, file another in his office, there to be carefully preserved and as soon as practicable transmit the remaining one to the collector or surveyor of the port of final destination of the merchandise: *Provided, however,* That no additional fee shall be collected on account of any service performed under the requirements of this section.

SEC. 5. That merchandise transported under the provisions of this act shall be conveyed in cars, vessels, or vehicles securely fastened with locks or seals, under the exclusive control of the officers of the customs; and merchandise may also be transported under the provisions of this act by express companies, on passenger trains, in safes and trunks, which shall be of such size, character, and description, and secured in such manner as shall be from time to time prescribed by the Secretary; and in cases where merchandise shall be imported in boxes or packages too large to be included in the safes or trunks so prescribed, such merchandise may be transported, under the provisions of this act, by such express companies, in a separate compartment of the car, secured in such manner as shall from time to time be prescribed by the Secretary of the Treasury; and merchandise such as pig-iron, spiegel-iron, scrap-iron, iron ore, railroad-iron, and similar articles commonly transported upon platform or flat cars, may be transported, under the provisions of this act, upon such platform or flat cars, and the weight of such merchandise so transported shall be ascertained in all cases before shipment, and ordinary railroad-scales may be used for such purpose; and inspectors shall be stationed at proper points along the designated routes, or upon any car, vessel, vehicle, or train at the discretion of the Secretary of the Treasury, and at the expense of the companies, respectively. Such merchandise shall not be unladen or transhipped between the ports of first arrival and final destination, unless authorized by the regulations of the Secretary of the Treasury in cases which may arise from a difference in the gauge of railroads, or

Invoice and entry.

Appraisement.

Common carriers to be designated by the Secretary of the Treasury.

Carriers to give bonds as may be required by the Secretary of the Treasury.

R. S. 2853, 2855, amended.

Proviso.

Transportation of merchandise under locks and seals.

How pig-iron, railroad-iron, &c., on platform cars may be transported.

Merchandise not to be unloaded before reaching destination.

Accidents or from accidents, or from legal intervention, or when by reason of the unsafe cars may length of the route the cars, after due inspection by customs officers, shall be considered unsafe or unsuitable to proceed further, or from necessitate trans-shipment.

low water, ice, or other unavoidable destruction to navigation; and in no case shall there be permitted any breaking of the original packages of such merchandise.

Ports of entry. SEC. 6. That merchandise so destined for immediate transportation shall be transferred, under proper supervision, directly from the importing vessel to the car, vessel, or vehicle in which the same is to be transported to its final destination.

Privilege of immediate trans-shipment extended to certain ports. SEC. 7. That the privilege of immediate transportation shall extend to the ports of New York and Buffalo, in New York; Burlington in Vermont; Boston, in Massachusetts; Providence and Newport in Rhode Island; New Haven, Middletown, and Hartford in Connecticut; Philadelphia and Pittsburgh, in Pennsylvania; Baltimore, Crisfield, and Annapolis in Maryland; Wilmington, and Seaford, in Delaware; Salem, Massachusetts; Georgetown in the District of Columbia; Norfolk, Richmond and Petersburg, in Virginia; Wilmington and New Berne, in North Carolina; Charleston and Port Royal, in South Carolina; Savannah and Brunswick, in Georgia; New Orleans, in Louisiana; Portland and Bath, in Maine; Portsmouth, in New Hampshire; Chicago, Cairo, Alton, and Quincy, in Illinois; Detroit, Port Huron, and Grand Haven, in Michigan; Saint Louis, Kansas City, and Saint Joseph, in Missouri; Saint Paul, in Minnesota; Cincinnati, Cleveland, and Toledo, in Ohio; Milwaukee, and La Crosse, in Wisconsin; Louisville, in Kentucky; San Francisco, San Diego and Wilmington, in California; Portland, in Oregon; Memphis, Nashville and Knoxville, in Tennessee; Mobile, in Alabama; and Evansville, in Indiana; and Galveston, Houston, Brownsville, Corpus Christi, and Indianola, in Texas; Omaha, in Nebraska; Dubuque, Burlington and Keokuk, in Iowa; Leavenworth, in Kansas; Tampa Bay, Fernandina, Jacksonville, Cedar Keys, Key West, and Apalachicola, in Florida: *Provided*, That the privilege of transportation herein conferred shall not extend to any place at which there are not the necessary officers for the appraisement of merchandise and the collection of duties.

R. S. 2990, 2991, 2992, 2993, 2994, 2995, 2996, 2997, repealed. SEC. 8. That sections twenty-nine hundred and ninety, twenty-nine hundred and ninety-one, twenty-nine hundred and ninety-two, twenty-nine hundred and ninety-three, twenty-nine hundred and ninety-four, twenty-nine hundred and ninety-five, twenty-nine hundred and ninety-six, and twenty-nine hundred and ninety-seven of the Revised Statutes be, and the same are hereby, repealed.

Provisions of this act not to apply to merchandise landed ten days. SEC. 9. That no merchandise shall be shipped under the provisions of this act after such merchandise shall have been landed ten days from the importing vessel, and merchandise not entered within such time shall be sent to a bonded warehouse by the collector as unclaimed, and held until regularly entered and appraised.

R. S. 2981, amended. SEC. 10. That section twenty-nine hundred and eighty-one of the Revised Statutes be amended so as to read as follows: That whenever the proper officer of the customs shall be duly notified in writing of the existence of a lien for freight upon imported goods, wares or merchandise in his custody, he shall, before delivering such goods, wares, or merchandise to the importer, owner, or consignee thereof, give seasonable notice to the party or parties claiming the lien; and the possession by the officers of customs shall not affect the discharge of such lien, under such regulations as the Secretary of the Treasury may prescribe; and such officer may refuse the delivery of such merchandise from any public or bonded warehouse or other place in which the same shall be deposited, until proof to his satisfaction shall be produced that the freight thereon has been paid or secured; but the rights of the United States shall not be prejudiced thereby, nor shall the United States or its officers be in any manner liable for losses consequent upon such refusal to deliver. If merchandise so subject to a lien regarding which notice has been filed, shall be forfeited to the United States and sold, the freight due thereon shall be paid from the proceeds of such sale in the same manner as other charges and expenses authorized by law to be paid therefrom are paid.

To take effect from and after 1st July, 1880. SEC. 11. That this act shall take effect and be in force from and after the first day of July, anno Domini eighteen hundred and eighty. Approved June 10, 1880.

ACT OF JUNE 14, 1880.

AN ACT to amend an act entitled "An act to amend the statutes in relation to immediate transportation of dutiable goods, and for other purposes." 21 Stat., 198.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in the act entitled "An act to amend the statutes in relation to immediate transportation of dutiable goods, and for other purposes," approved June tenth, eighteen hundred and eighty, the words "section four," where they occur in the first section of the act, be changed to "section five." "Section four" changed to "section five."

Approved June 14, 1880.

ACT OF JUNE 15, 1880.

AN ACT making appropriations for the legislative, executive, and judicial expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and eighty-one, and for other purposes. 21 Stat., 233.

OFFICE OF AUDITOR OF RAILROAD ACCOUNTS.—For auditor, three thousand six hundred dollars; bookkeeper, two thousand four hundred dollars; assistant book-keeper, two thousand dollars; railroad engineer, two thousand dollars; one clerk, one thousand four hundred dollars; one copyist, nine hundred dollars; one messenger, six hundred dollars; traveling and other expenses, two thousand five hundred dollars; incidental expenses, three hundred dollars; in all, fifteen thousand seven hundred dollars. Auditor of Railroad Accounts, bookkeeper, clerks, and others. Traveling and incidental expenses.

ACT OF JUNE 16, 1880.

AN ACT making appropriations to supply deficiencies in the appropriations for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for prior years, and for those certified as due by the accounting-officers of the Treasury in accordance with section four of the act of June fourteenth, eighteen hundred and seventy-eight, heretofore paid from permanent appropriations, and for other purposes. 21 Stat., 245.

OFFICE OF THE AUDITOR OF RAILROAD ACCOUNTS.—For traveling and incidental expenses of the office, seven hundred and fifty dollars.

APPENDIX G.

Laws of the United States relating to the Northern Pacific Railroad, the Atlantic and Pacific Railroad, the Texas and Pacific Railway, the Southern Pacific Railroad, the California and Oregon Railroad, the Oregon and California Railroad, and the Oregon Central Railroad Companies.

CONTENTS.

Subject.	Date of approval.	U. S. Statutes.	
		Vol.	Page.
<i>Laws relating to the Northern Pacific Railroad.</i>			
Charter act	July 12, 1864	13	265
Extension of time—two years	May 7, 1866	14	355
Reports (repealed)	June 25, 1868	15	79
Extension of time—one year	July 1, 1866	15	255
Consent to issue bonds secured by mortgage	Mar. 1, 1869	15	346
Branch line authorized from Portland to Puget Sound	Apr. 10, 1869	16	57
Appropriation for surveying lands	July 15, 1870	16	305
Issue of bonds authorized	May 31, 1870	16	378
Bridge across the Saint Louis River	Feb. 27, 1873	17	477
<i>Laws relating to Atlantic and Pacific Railroad.</i>			
Charter act	July 27, 1866	14	292
Reports (repealed)	July 25, 1868	15	79
Mortgage authorized	Apr. 20, 1871	17	19
<i>Laws relating to the Texas and Pacific Railway.</i>			
Charter act	Mar. 3, 1871	16	265
Name of company changed	May 2, 1872	17	59
Former mortgages legalized	Mar. 3, 1873	17	696
Authorized to secure construction bonds by new mortgage	June 22, 1874	18	197
<i>Laws relating to the Southern Pacific Railroad.</i>			
Connection with Atlantic and Pacific	July 7, 1866	14	292
Connection with Texas and Pacific	Mar. 3, 1871	16	573
<i>Laws relating to the California and Oregon and the Oregon and California Railroads.</i>			
Land grant	July 25, 1866	14	239
Extension of time—eighteen months	June 25, 1868	15	80
Time of acceptance extended to April 10, 1870	Apr. 10, 1869	16	47
<i>Laws relating to the Oregon Central Railroad.</i>			
Land grant	May 4, 1870	16	94

LAWS RELATING TO THE NORTHERN PACIFIC RAILROAD.

Subject.	Date of approval.	U. S. Statutes.	
		Vol.	Page.
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ACT OF JULY 2, 1864.

13 Stat., 265.

CHAP. CCXVII.—An act granting lands to aid in the construction of a railroad and telegraph line from Lake Superior to Puget's Sound, on the Pacific coast, by the northern route.

Northern Pacific Railroad Company incorporated.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Richard D. Rice, John A. Poore, Samuel P. Strickland, Samuel C. Fessenden, Charles P. Kimball, Augustine Haines, Edwin R. W. Wiggins, Anson F. Morrill, Samuel J. Anderson, of Maine; Willard Sears, I. S. Withington, Josiah Per-

ham, James M. Becket, A. W. Banfield, Abiel Abbott, John Newell, Austin L. Rogers, Nathaniel Greene, jr., Oliver Frost, John A. Bass, John O. Bresbrey, George Shiverick, Edward Tyler, Filander J. Forristall, Ivory H. Pope, of Massachusetts; George Opdyke, Fairley Holmes, John Huggins, Philander Reed, George Briggs, Chauncey Vibbard, John C. Fremont, of New York; Ephraim Marsh, John P. Jackson, jr., of New Jersey; S. M. Felton, John Toy, O. J. Dickey, B. F. Archer, G. W. Case, J. Edgar Thompson, John A. Green, of Pennsylvania; T. M. Allyn, Moses W. Wilson, Horace Whittaker, Ira Bliss, of Connecticut; Joseph A. Gilmore, Onslow Stearns, E. P. Emerson, Frederick Smyth, William E. Chandler, of New Hampshire; Cyrus Aldrich, H. M. Rice, John McKusick, H. C. Waite, Stephen Miller, of Minnesota; E. A. Chapin, John Gregory Smith, George Merrill, of Vermont; James Y. Smith, William S. Slater, Isaac H. Southwick, Earl P. Mason, of Rhode Island; Seth Fuller, William Kellogg, U. S. Grant, William B. Ogden, William G. Greene, Leonard Sweat, Henry W. Blodgett, Porter Sheldon, of Illinois; J. M. Winchell, Elsworth Cheesebrough, James S. Emery, of Kansas; Richard F. Perkins, Richard Chenery, Samuel Brannan, George Rowland, Henry Platt, of California; William F. Mercer, James W. Brownley, of Virginia; John H. B. Latrobe, W. Prescott Smith, of Maryland; Greenbury Slack, A. J. Boreman, of West Virginia; Thomas E. Bramlette, Frank Shorin, of Kentucky; John Brough, John A. Bingham, Oran Follett, John Gardner, S. S. L. Hommedieu, Harrison G. Blaike, Philo Chamberlin, of Ohio; John A. Duncan, Samuel M. Harrington, of Delaware; Thomas A. Morris, Jesse L. Williams, of Indiana; Samuel L. Case, Henry L. Hall, David H. Jerome, Thomas D. Gilbert, C. A. Trowbridge, of Michigan; Edward H. Broadhead, Alexander Mitchell, Benjamin Ferguson, Levi Sterling,

— Marshal, of Wisconsin; J. C. Ainsworth, Orlando Humason, H. W. Corbett, Henry Failling, of Oregon; J. B. S. Todd, M. K. Armstrong, J. Shaw Gregory, J. Le Berge, of Dakota Territory; John Mullan, Anson G. Henry, S. D. Smith, Charles Terry, of Washington Territory; H. W. Starr, Platt Smith, Nixon Denton, William Leighton, B. F. Allen, Reuben Noble, John L. Davies, of Iowa; Willard P. Hall, George R. Smith, H. Gayle King, John C. Sargeant, of Missouri; William H. Wallace, of Idaho Territory; J. H. Lathrop, Henry D. Cooke, H. E. Merrick, of the District of Columbia, and all such other persons who shall or may be associated with them, and their successors, are hereby created and erected into a body corporate and politic, in deed and in law, by the name, style, and title of the "Northern Pacific Railroad Company," and by that name shall have perpetual succession, and shall be able to sue and to be sued, plead and be impleaded, defend and be defended, in all courts of law and equity within the United States, and may make and have a common seal. And said corporation is hereby authorized and empowered to lay out, locate, construct, furnish, maintain, and enjoy a continuous railroad and telegraph line, with the appurtenances, namely, beginning at a point on Lake Superior, in the State of Minnesota or Wisconsin; thence westerly by the most eligible railroad route, as shall be determined by said company, within the territory of the United States, on a line north of the forty-fifth degree of latitude to some point on Puget's Sound, with a branch, via the valley of the Columbia River, to a point at or near Portland, in the State of Oregon, leaving the main trunk line at the most suitable place, not more than three hundred miles from its western terminus; and is hereby vested with all the powers, privileges, and immunities necessary to carry into effect the purposes of this act as herein set forth. The capital stock of said company shall consist of one million shares of one hundred dollars each, which shall in all respects be deemed personal property, and shall be transferable in such manner as the by-laws of said corporation shall provide. The persons hereinbefore named are hereby appointed commissioners, and shall be called the Board of Commissioners of the "Northern Pacific Railroad Company," and fifteen shall constitute a quorum for the transaction of business. The first meeting of said board of commissioners shall be held at Melodion Hall, in the city of Boston, at such time as any five commissioners herein named from Massachusetts shall appoint, not more than three months after the passage of this act, notice of which shall be given by them to the other commissioners by publishing said notice

Name.

Empowered to lay out, construct, and enjoy a continuous railroad and telegraph line.

From Lake Superior, on a line north of the 45th degree of latitude, to Puget's Sound.

Right to construct a branch to Portland, Oregon.

Capital stock 1,000,000.

Board of Commissioners appointed.

First meeting to be held in Boston, Mass.

in at least one daily newspaper in the cities of Boston, New York, Philadelphia, Cincinnati, Milwaukee, and Chicago, once a week at least four weeks previous to the day of meeting. Said board shall organize by the choice from its number of a president, vice president, secretary, and treasurer, and they shall require from said treasurer such bonds as may be deemed proper, and may from time to time increase the amount thereof as they may deem proper. The secretary shall be sworn to the faithful performance of his duties, and such oath shall be entered upon the records of the company, signed by him, and the oath verified thereon.

Officers to be chosen from the board of commissioners.

Books of subscriptions to be opened in such cities as the board may determine.

First meeting of subscribers to capital stock.

Thirteen directors to be elected by stockholders.

Commissioners to deliver to directors all properties, &c.

Annual meetings to be held as prescribed in by-laws.

Grant of right of way.

Authority to take from adjacent lands materials for construction.

Right of way 200 feet in width on each side of said railroad.

Right of way exempt from taxation.

Indian titles to be extinguished by the United States.

Grant of land.

Forty sections per mile in the Territories.

Twenty sections per mile in the States.

The president and secretary of said board shall in like manner call all other meetings, naming the time and place thereof. It shall be the duty of said board of commissioners to open books, or cause books to be opened, at such times, and in such principal cities or other places in the United States, as they, or a quorum of them, shall determine, within six months after the passage of this act, to receive subscriptions to the capital stock of said corporation, and a cash payment of ten per centum on all subscriptions, and to receipt therefor. So soon as twenty thousand shares shall in good faith be subscribed for, and ten dollars per share actually paid into the treasury of the company, the said president and secretary of said board of commissioners shall appoint a time and place for the first meeting of the subscribers to the stock of said company, and shall give notice thereof in at least one newspaper in each State in which subscription books have been opened, at least fifteen days previous to the day of meeting, and such subscribers as shall attend the meeting so called, either in person or by lawful proxy, then and there shall elect by ballot thirteen directors for said corporation; and in such election each share of said capital stock shall entitle the owner thereof to one vote. The president and secretary of the board of commissioners, and, in case of their absence or inability, any two of the officers of said board, shall act as inspectors of said election, and shall certify under their hands the names of the directors elected at said meeting; and the said commissioners, the treasurer, and secretary, shall then deliver over to said directors all the properties, subscription books, and other books in their possession, and thereupon the duties of said commissioners and the officers previously appointed by them, shall cease and determine forever, and thereafter the stockholders shall constitute said body politic and corporate. Annual meetings of the stockholders of the said corporation for the choice of officers (when they are to be chosen) and for the transaction of business, shall be held at such time and place and upon such notice as may be prescribed in the by-laws.

SEC. 2. *And be it further enacted*, That the right of way through the public lands be, and the same is hereby, granted to said "Northern Pacific Railroad Company," its successors and assigns, for the construction of a railroad and telegraph as proposed; and the right, power, and authority is hereby given to said corporation to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof. Said way is granted to said railroad to the extent of two hundred feet in width on each side of said railroad where it may pass through the public domain, including all necessary ground for station building, workshops, depots, machine-shops, switches, side tracks, turn-tables, and water-stations; and the right of way shall be exempt from taxation within the Territories of the United States. The United States shall extinguish, as rapidly as may be consistent with public policy and the welfare of the said Indians, the Indian titles to all lands falling under the operation of this act, and acquired in the donation to the [road] named in this bill.

SEC. 3. *And be it further enacted*, That there be, and hereby is, granted to the "Northern Pacific Railroad Company," its successors and assigns, for the purpose of aiding in the construction of said railroad and telegraph line to the Pacific coast, and to secure the safe and speedy transportation of the mails, troops, munitions of war, and public stores, over the route of said line of railway, every alternate section of public land, not mineral, designated by odd numbers, to the amount of twenty alternate sections per mile, on each side of said railroad line, as said company may adopt, through the Territories of the United States, and ten alternate sections of land per mile on each side of said railroad whenever it passes through any State, and whenever

on the line thereof, the United States have full title, not reserved, sold, granted, or otherwise appropriated, and free from preëmption, or other claims or rights, at the time the line of said road is definitely fixed, and a plat thereof filed in the office of the commissioner of the general land office; and whenever, prior to said time, any of said sections or parts of sections shall have been granted, sold, reserved, occupied by homestead settlers, or preëmpted, or otherwise disposed of, other lands shall be selected by said company in lieu thereof, under the direction of the Secretary of the Interior, in alternate sections, and designated by odd numbers, not more than ten miles beyond the limits of said alternate sections: *Provided*, That if said route shall be found upon the line of any other railroad route to aid in the construction of which lands have been heretofore granted by the United States, as far as the routes are upon the same general line, the amount of land heretofore granted shall be deducted from the amount granted by this act: *Provided, further*, That the railroad company receiving the previous grant of land may assign their interest to said "Northern Pacific Railroad Company," or may consolidate, confederate, and associate with said company upon the terms named in the first section of this act: *Provided, further*, That all mineral lands be, and the same are hereby, excluded from the operations of this act, and in lieu thereof a like quantity of unoccupied and unappropriated agricultural lands, in odd numbered sections, nearest to the line of said road may be selected as above provided: *And provided, further*, That the word "mineral", when it occurs in this act, shall not be held to include iron or coal: *And provided, further*, That no money shall be drawn from the Treasury of the United States to aid in the construction of the said "Northern Pacific Railroad."

SEC. 4. *And be it further enacted*, That whenever said "Northern Pacific Railroad Company" shall have twenty-five consecutive miles of any portion of said railroad and telegraph line ready for the service contemplated, the President of the United States shall appoint three commissioners to examine the same, and if it shall appear that twenty-five consecutive miles of said road and telegraph line have been completed in a good, substantial, and workmanlike manner, as in all other respects required by this act, the commissioners shall so report to the President of the United States, and patents of lands, as aforesaid, shall be issued to said company, confirming to said company the right and title to said lands, situated opposite to, and coterminous with, said completed section of said road; and, from time to time, whenever twenty-five additional consecutive miles shall have been constructed, completed, and in readiness as aforesaid, and verified by said commissioners to the President of the United States, then patents shall be issued to said company conveying the additional sections of land as aforesaid, and so on as fast as every twenty-five miles of said road is completed as aforesaid: *Provided*, That not more than ten sections of land per mile, as said road shall be completed, shall be conveyed to said company for all that part of said railroad lying east of the western boundary of the State of Minnesota, until the whole of said railroad shall be finished and in good running order, as a first-class railroad, from the place of beginning on Lake Superior to the western boundary of Minnesota: *Provided, also*, That lands shall not be granted under the provisions of this act on account of any railroad, or part thereof, constructed at the date of the passage of this act.

SEC. 5. *And be it further enacted*, That said Northern Pacific Railroad shall be constructed in a substantial and workmanlike manner, with all the necessary draws, culverts, bridges, viaducts, crossings, turnouts, stations, and watering places, and all other appurtenances, including furniture, and rolling stock, equal in all respects to railroads of the first class, when prepared for business, with rails of the best quality, manufactured from American iron. And a uniform gauge shall be established throughout the entire length of the road. And there shall be constructed a telegraph line, of the most substantial and approved description, to be operated along the entire line: *Provided*, That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service. And it shall be the duty of the Northern Pacific Railroad Company to permit any other railroad which shall be authorized to be built by the United States, or by the legislature of any Territory or State in which the same may be situated, to form running connections with it, on fair and equitable terms.

Other lands in lieu of those reserved, &c.

Land limits.

Ifronte upon the line of any other aided road former grant shall be deducted.

Road having previous grant may assign.

"Mineral" lands not granted.

Agricultural lands may be selected in lieu of mineral lands.

"Mineral" does not include iron or coal.

The President to appoint three commissioners to examine road.

Commissioners to report to the President.

Proviso as to lands in Minnesota.

Proviso as to road previously built.

Road to be constructed as a "first-class" railroad.

Rails of American iron. (See res. 16 Stat. 378.)

Gauge to be uniform.

Telegraph line. Condition as to changes for Government transportation and telegraphic service.

Other roads may form running connections on equitable terms.

Lands to be surveyed as fast as construction of road may require.

Government lands not to be sold for less than \$2.50 per acre.

Authorizes company to take any lands necessary for construction of its road.

200 feet on each side.

Lands for depots, &c.

Damages to be determined by commissioners.

Procedure.

What proceedings in cases of lands held by any infant or person subject to any legal disability.

SEC. 6. *And be it further enacted*, That the President of the United States shall cause the lands to be surveyed for forty miles in width on both sides of the entire line of said road, after the general route shall be fixed, and as fast as may be required by the construction of said railroad; and the odd sections of land hereby granted shall not be liable to sale, or entry, or preemption before or after they are surveyed, except by said company, as provided in this act; but the provisions of the act of September, eighteen hundred and forty-one, granting preemption rights, and the acts amendatory thereof, and of the act entitled "An act to secure homesteads to actual settlers on the public domain," approved May twenty, eighteen hundred and sixty-two, shall be, and the same are hereby, extended to all other lands on the line of said road, when surveyed, excepting those hereby granted to said company. And the reserved alternate sections shall not be sold by the government at a price less than two dollars and fifty cents per acre, when offered for sale.

SEC. 7. *And be it further enacted*, That the said "Northern Pacific Railroad Company" be, and is hereby, authorized and empowered to enter upon, purchase, take, and hold any lands or premises that may be necessary and proper for the construction and working of said road, not exceeding in width two hundred feet on each side of the line of its railroad, unless a greater width be required for the purpose of excavation or embankment; and also any lands or premises that may be necessary and proper for turnouts, standing places for cars, depots, station-houses, or any other structures required in the construction and working of said road. And the said company shall have the right to cut and remove trees and other material that might, by falling, encumber its road-bed, though standing or being more than two hundred feet from the line of said road. And in case the owner of such lands or premises and the said company cannot agree as to the value of the premises taken, or to be taken, for the use of said road, the value thereof shall be determined by the appraisal of three disinterested commissioners, who may be appointed, upon application by either party, to any court of record in any of the Territories in which the lands or premises to be taken lie; and said commissioners, in their assessment of damages, shall appraise such premises at what would have been the value thereof if the road had not been built. And upon return into court of such appraisement, and upon the payment into the same of the estimated value of the premises taken for the use and benefit of the owner thereof, said premises shall be deemed to be taken by said company, which shall thereby acquire full title to the same for the purposes aforesaid. And either party feeling aggrieved at said appraisement may, within thirty days after the same has been returned into court, file an appeal therefrom, and demand a jury of twelve men to estimate the damage sustained; but such appeal shall not interfere with the rights of said company to enter upon the premises taken, or to do any act necessary and proper in the construction of its road. And said party appealing shall give bonds, with sufficient surety or sureties, for the payment of any cost that may arise upon such appeal; and in case the party appealing does not obtain a verdict, increasing or diminishing, as the case may be, the award of the commissioners, such party shall pay the whole cost incurred by the appellee, as well as his own, and the payment into court, for the use of the owner of said premises taken, of a sum equal to that finally awarded, shall be held to vest in said company the title of said land, and of the right to use and occupy the same for the construction, maintenance, and operation of said road. And in case any of the lands to be taken, as aforesaid, shall be held by any infant, femme covert, non compos, insane person, or persons residing without the Territory within which the lands to be taken lie, or persons subjected to any legal disability, the court may appoint a guardian for any party under any disqualification, to appear in proper person, who shall give bonds, with sufficient surety or sureties, for the proper and faithful execution of his trust, and who may represent in court the person disqualified, as aforesaid, from appearing, when the same proceedings shall be had in reference to the appraisement of the premises to be taken for the use of said company, and with the same effect as has been already described; and the title of the company to the lands taken by virtue of this act shall not be affected or impaired by reason of any failure by any guard-

ian to discharge faithfully his trust. And in case any party shall have a right or claim to any land for a term of years, or any interest therein, in possession, reversion, or remainder, the value of any such estate, less than a fee simple, shall be estimated and determined in the manner hereinbefore set forth. And in case it shall be necessary for the company to enter upon any lands which are unoccupied, and of which there is no apparent owner or claimant, it may proceed to take and use the same for the purposes of said railroad, and may institute proceedings, in manner described, for the purpose of ascertaining the value of, and of acquiring title to, the same; but the judge of the court hearing said suit shall determine the kind of notice to be served on such owner or owners, and he may in its discretion appoint an agent or guardian to represent such owner or owners in case of his or their incapacity or non-appearance. But in case no claimant shall appear within six years from the time of the opening of said road across any land, all claims to damages against said company shall be barred.

SEC. 8. *And be it further enacted*, That each and every grant, right, and privilege herein are so made and given to, and accepted by, said Northern Pacific Railroad Company, upon and subject to the following conditions, namely: that the said company shall commence the work by on said road within two years from the approval of this act by the President, and shall complete not less than fifty miles per year after the second year, and shall construct, equip, furnish, and complete the whole road by the fourth day of July, anno Domini eighteen hundred and seventy-six.

SEC. 9. *And be it further enacted*, That the United States make the several conditioned grants herein, and that the said Northern Pacific Railroad Company accept the same, upon the further condition that if the said company make any breach of the conditions hereof, and allow the same to continue for upwards of one year, then, in such case, at any time hereafter, the United States, by its Congress, may do any and all acts and things which may be needful and necessary to insure a speedy completion of the said road.

SEC. 10. *And be it further enacted*, That all people of the United States shall have the right to subscribe to the stock of the Northern Pacific Railroad Company until the whole capital named in this act of incorporation is taken up, by complying with the terms of subscription; and no mortgage or construction bonds shall ever be issued by said company on said road, or mortgage, or lien made in any way, except by the consent of the Congress of the United States.

SEC. 11. *And be it further enacted*, That said Northern Pacific Railroad, or any part thereof, shall be a post-route and a military road, subject to the use of the United States, for postal, military, naval, and all other government service, and also subject to such regulations as Congress may impose restricting the charges for such government transportation.

SEC. 12. *And be it further enacted*, That the acceptance of the terms, conditions, and impositions of this act by the said Northern Pacific Railroad Company shall be signified in writing under the corporate seal of said company, duly executed pursuant to the direction of its board of directors first had and obtained, which acceptance shall be made within two years after the passage of this act, and not afterwards, and shall be served on the President of the United States.

SEC. 13. *And be it further enacted*, That the directors of said company shall make an annual report of their proceedings and expenditures, verified by the affidavits of the president and at least six of the directors, and they shall, from time to time, fix, determine, and regulate the fares, tolls, and charges to be received and paid for transportation of persons and property on said road, or any part thereof.

SEC. 14. *And be it further enacted*, That the directors chosen in pursuance of the first section of this act shall, as soon as may be after their election, elect from their own number a president and vice-president; and said board of directors shall, from time to time, and so soon as may be after their election, choose a treasurer and secretary, who shall hold their offices at the will and pleasure of the board of directors. The treasurer and secretary shall give such bonds, with such security as the said board from time to time may require. The secretary shall, before entering upon his duty, be sworn to the faithful discharge there-

Other proceed-
ings.

Proceedings
when lands are
unoccupied.

Claims barred
if not made
within six years.

Grants made
subject to certain
conditions.

Whole road to
be completed by
July 4, 1876.
(Joint res. May 7,
1868, time extended
two years;
joint res. July 1,
1868, sec. 8,
amended, time
extended one
year).

Congress may
do anything neces-
sary to insure
a speedy comple-
tion of the road.

All people of
the United States
may subscribe to
the stock, until
whole amount is
taken up.

No bonds to be
issued without
consent of Con-
gress.

To be a post-
route and mili-
tary road.

Congress may
restrict charges
for government
transportation.

Company to ac-
cept terms, con-
ditions, &c., with-
in two years.

Annual report
to be verified by
affidavits of pres-
ident and six di-
rectors of com-
pany.

Election of Pres-
ident and Vice-
President from
Board of Direct-
ors.

Treasurer and
Secretary.

of, and said oath shall be made a matter of record upon the books of said corporation. No person shall be a director of said company unless he shall be a stockholder, and qualified to vote for directors at the election at which he shall be chosen.

Term of office of President, Vice-President, and Directors not to exceed three years.

Directors empowered to make by-laws, rules, and regulations.

Directors may fill vacancies in board.

Directors empowered to appoint engineers, agents, &c.

Directors to require payment of ten per centum cash assessment, and balance of subscription when needed.

Forfeited stock may be redeemed on terms prescribed by Directors.

Company authorized to accept other grants, franchises, &c.

Consent of State legislatures to be obtained.

Act to be null and void, unless two millions of dollars of stock are subscribed for within two years.

Congress may add to, alter, amend, or repeal this act, having due regard for the rights of the company.

SEC. 15. *And be it further enacted*, That the president, vice-president, and directors shall hold their offices for the period indicated in the by-laws of said company, not exceeding three years, respectively, and until others are chosen in their place, and qualified. In case it shall so happen that an election of directors shall not be made on any day appointed by the by-laws of said company, the corporation shall not for that excuse be deemed to be dissolved, but such election may be holden on any day which shall be appointed by the directors. The directors, of whom seven, including the president, shall be a quorum for the transaction of business, shall have full power to make and prescribe such by-laws, rules, and regulations as they shall deem needful and proper touching the disposition and management of the stock, property, estate, and effects of the company, the transfer of shares, the duties and conduct of their officers and servants touching the election and meeting of the directors, and all matters whatsoever which may appertain to the concerns of said company; and the said board of directors may have full power to fill any vacancy or vacancies that may occur from any cause or causes from time to time in their said board. And the said board of directors shall have power to appoint such engineers, agents, and subordinates as may from time to time be necessary to carry into effect the object of the company, and to do all acts and things touching the location and construction of said road.

SEC. 16. *And be it further enacted*, That it shall be lawful for the directors of said company to require payment of the sum of ten per centum cash assessment upon all subscriptions received of all subscribers, and the balance thereof at such times and in such proportions and on such conditions as they shall deem to be necessary to complete the said road and telegraph line within the time in this act prescribed. Sixty days' previous notice shall be given of the payments required, and of the time and place of payment, by publishing a notice once a week in one daily newspaper in each of the cities of Boston, New York, Philadelphia, and Chicago; and in case any stockholder shall neglect or refuse to pay, in pursuance of such notice, the stock held by such person shall be forfeited absolutely to the use of the company, and also any payment or payments that shall have been made on account thereof, subject to the condition that the board of directors may allow the redemption on such terms as they may prescribe.

SEC. 17. *And be it further enacted*, That the said company is authorized to accept to its own use any grant, donation, loan, power, franchise, aid, or assistance which may be granted to, or conferred upon, said company by the Congress of the United States, by the legislature of any State, or by any corporation, person, or persons; and said corporation is authorized to hold and enjoy any such grant, donation, loan, power, franchise, aid, or assistance, to its own use for the purpose aforesaid.

SEC. 18. *And be it further enacted*, That said Northern Pacific Railroad Company shall obtain the consent of the legislature of any State through which any portion of said railroad line may pass, previous to commencing the construction thereof; but said company may have the right to put on engineers and survey the route before obtaining the consent of the legislature.

SEC. 19. *And be it further enacted*, That unless said Northern Pacific Railroad Company shall obtain *bona fide* subscriptions to the stock of said company to the amount of two millions of dollars, with ten per centum paid within two years after the passage and approval of this act, it shall be null and void.

SEC. 20. *And be it further enacted*, That the better to accomplish the object of this act, namely, to promote the public interest and welfare by the construction of said railroad and telegraph line, and keeping the same in working order, and to secure to the government at all times (but particularly in time of war) the use and benefits of the same for postal, military, and other purposes, Congress may, at any time, having due regard for the rights of said Northern Pacific Railroad Company, add to, alter, amend, or repeal this act.

Approved July 2, 1864.

JOINT RESOLUTION OF MAY 7, 1866.

No. 34.—A RESOLUTION extending the time for the completion of the Union Pacific Railroad, eastern division. 14 Stat., 355.

SEC. 2. *And be it further resolved*, That the time for commencing and completing the Northern Pacific Railroad, and all its several sections, is extended for the term of two years. Northern Pacific Railroad.

Approved, May 7, 1866.

ACT OF JUNE 25, 1868.

(Repealed.)

CHAP. LXXVII.—An act relative to filing reports of railroad companies.

15 Stat., 79.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the reports required to be made to the Secretary of the Treasury on or before the first day of July of each year, by the corporations created by or entitled to subsidies under the provisions of an act entitled "An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes," approved July first, eighteen hundred and sixty-two, and the acts supplemental to and amendatory thereof, shall hereafter be made to the Secretary of the Interior, on or before the first day of October of each year. Said reports shall furnish full and specific information upon the several points mentioned in the twentieth section of the said act of eighteen hundred and sixty-two, and shall be verified as therein prescribed, and on failure to make the same as herein required, the issue of bonds or patents to the company in default shall be suspended until the requirements of this act shall be complied with by such company. And the reports hitherto made to the Secretary of the Treasury under the said act of July first, eighteen hundred and sixty-two, shall be transferred and delivered by him to the Secretary of the Interior to be filed by him.

Reports to the Secretary of the Interior to be made on or before the first day of October of each year, by a subsidized Pacific railroad companies.

SEC. 2. *And be it further enacted*, That the corporations created by the provisions of the acts of Congress approved July second, eighteen hundred and sixty-four, and July twenty-seventh, eighteen hundred and sixty-six, and known as the Northern Pacific Railroad Company, the Atlantic and Pacific Railroad Company, and the Southern Pacific Railroad Company, shall make reports to the Secretary of the Interior on or before the first day of October of each year, as are required to be made by the Union Pacific Railroad and branches, under the provisions of the first section of this act, and on failure so to do, shall be subject to the like suspension. Northern Pacific, Atlantic and Pacific, and Southern Pacific. Railroad companies to report at same time as the Union Pacific Railroad Company.

SEC. 3. *And be it further enacted*, That the reports required from the commissioners appointed to examine and report in relation to the road of any of the corporations whereto reference is made in this act, shall be addressed to and filed in the Department of the Interior; and all such reports heretofore made shall be transferred to and filed in said Department of the Interior; and so much of any and all acts as requires any reports from such companies, or any officers thereof, to be made to the Secretary of the Treasury, is hereby repealed. Reports of examining commissioners to be addressed to and filed in the Department of the Interior.

SEC. 4. *And be it further enacted*, That, in addition to the eight subjects referred to in section twenty of the act of July, eighteen hundred and sixty-two, to be reported upon, there shall also be furnished annually to the Secretary of the Interior all reports of engineers, superintendents, or other officers who make annual reports to any of said railroad companies. Annual reports of officers to be furnished annually to the Secretary of the Interior.

Approved, June 25, 1868.

(The foregoing act was repealed by act of Congress, approved June 19, 1878, 20 U. S. Stat., 169.)

JOINT RESOLUTION OF JULY 1, 1868.

No. 47.—JOINT RESOLUTION extending the time for the completion of the Northern Pacific Railroad. 15 Stats., p. 255.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That section eight of an act entitled "An act granting lands to aid in the construction of a railroad and telegraph line from Lake Superior to Puget Sound, on the Pacific" Section 8, chap. 217, 13 Stats., 370, amended.

Time extended to July 4, 1879. (See Res. of May 7, 1869, 14 Stat. 355.)

coast," is hereby so amended as to read as follows: That each and every grant, right, and privilege herein, are so made and given to and accepted by said Northern Pacific Railroad Company upon and subject to the following conditions, namely: That the said company shall commence the work on said road within two years from and after the second day of July, eighteen hundred and sixty-eight, and shall complete not less than one hundred miles per year after the second year thereafter, and shall construct, equip, furnish, and complete the whole road by the fourth day of July, anno Domini eighteen hundred and seventy-seven.

Approved, July 1, 1863.

JOINT RESOLUTION OF MARCH 1, 1869.

15 Stat., 346.
13 Stat., 370.

No. 15.—JOINT RESOLUTION granting the Consent of Congress provided for in section ten of the Act incorporating the Northern Pacific Railroad Company, approved July second, eighteen hundred and sixty-four.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the Congress of the United States is hereby given to the Northern Pacific Railroad Company to issue its bonds, and to secure the same by mortgage upon its railroad and its telegraph line, for the purpose of raising funds with which to construct said railroad and telegraph line between Lake Superior and Puget Sound, and also upon its branch to a point at or near Portland, Oregon; and the term "Puget Sound," as used here and in the act incorporating said company, is hereby construed to mean all the waters connected with the Straits of Juan de Fuca within the territory of the United States.

Meaning of term, "Puget Sound."

Approved, March 1, 1869.

JOINT RESOLUTION OF APRIL 10, 1869.

16 Stat., 57.

No. 20.—JOINT RESOLUTION granting Right of Way for the Construction of a Railroad from a Point at or near Portland, Oregon, to a Point west of the Cascade Mountains, in Washington Territory.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Northern Pacific Railroad Company be, and hereby is, authorized to extend its branch line from a point at or near Portland, Oregon, to some suitable point on Puget Sound, to be determined by said company, and also to connect the same with its main line west of the Cascade mountains, in the Territory of Washington; said extension being subject to all the conditions and provisions, and said company in respect thereto being entitled to all the rights and privileges conferred by the act incorporating said company, and all acts additional to and amendatory thereof: *Provided,* That said company shall not be entitled to any subsidy in money, bonds, or additional lands of the United States, in respect to said extension of its branch line as aforesaid, except such lands as may be included in the right of way on the line of such extension as it may be located: *And provided further,* That at least twenty-five miles of said extension shall be constructed before the second day of July, eighteen hundred and seventy-one, and forty miles per year thereafter until the whole of said extension shall be completed.

Not entitled hereby to any subsidy or additional lands.

Approved, April 10, 1869.

16 Stat., 305.

CHAP. CCXCII.—An Act making Appropriations for sundry civil Expenses of the Government for the Year ending June thirty, eighteen hundred and seventy-one, and for other Purposes.

Appropriation for survey of the public lands within the limits of the land grant to the Northern Pacific Railroad Company in a direct line extending from Du Luth, on Lake Superior, to Georgetown, on the Red River of the North, ninety-five thousand nine hundred and eighty dollars: *Provided,* That five thousand dollars of this appropriation shall be expended for office work by the surveyor-general of Minnesota: *And pro-*

vided further, That before any land granted to said company by the United States shall be conveyed to any party entitled thereto under any of the acts incorporating or relating to said company, there shall first be paid into the Treasury of the United States the cost of surveying, selecting, and conveying the same, by the said company or party in interest.

Approved, July 15, 1870.

RESOLUTION OF MAY 31, 1870.

No. 67.—A RESOLUTION authorizing the Northern Pacific Railroad Company to issue its Bonds for the Construction of its Road and to secure the same by Mortgage, and for other Purposes. 16 Stat., 378.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Northern Pacific Railroad Company be, and hereby is, authorized to issue its bonds to aid in the construction and equipment of its road, and to secure the same by mortgage on its property and rights of property of all kinds and descriptions, real, personal, and mixed, including its franchise as a corporation; and, as proof and notice of its legal execution and effectual delivery, said mortgage shall be filed and recorded in the office of the Secretary of the Interior; and also to locate and construct, under the provisions and with the privileges, grants, and duties provided for in its act of incorporation, its main road to some point on Puget Sound, via the valley of the Columbia River, with the right to locate and construct its branch from some convenient point on its main trunk line across the Cascade Mountains to Puget Sound; and in the event of there not being in any State or Territory in which said main line or branch may be located, at the time of the final location thereof, the amount of lands per mile granted by Congress to said company, within the limits prescribed by its charter, then said company shall be entitled, under the directions of the Secretary of the Interior, to receive so many sections of land belonging to the United States, and designated by odd numbers, in such State or Territory, within ten miles on each side of said road, beyond the limits prescribed in said charter, as will make up such deficiency, on said main line or branch, except mineral and other lands as exempted in the charter of said company of eighteen hundred and sixty-four, to the amount of the lands that have been granted, sold, reserved, occupied by homestead settlers, pre-empted, or otherwise disposed of subsequent to the passage of the act of July two, eighteen hundred and sixty-four, and that twenty-five miles of said main line between its western terminus and the city of Portland, in the State of Oregon, shall be completed by the first day of January, anno Domini eighteen hundred and seventy-two, and forty miles of the remaining portion thereof each year thereafter, until the whole shall be completed between said points: *Provided*, that all lands hereby granted to said company which shall not be sold or disposed of or remain subject to the mortgage by this act authorized, at the expiration of five years after the completion of the entire road, shall be subject to settlement and pre-emption like other lands, at a price to be paid to said company not exceeding two dollars and fifty cents per acre; and if the mortgage hereby authorized shall at any time be enforced by foreclosure or other legal proceeding, or the mortgaged lands hereby granted, or any of them, be sold by the trustees to whom such mortgage may be executed, either at its maturity or for any failure or default of said company under the terms thereof, such lands shall be sold at public sale, at places within the States and Territories in which they shall be situate, after not less than sixty days previous notice, in single sections or subdivisions thereof, to the highest and best bidder: *Provided further*, That in the construction of the said railroad, American iron or steel only shall be used, the same to be manufactured from American ores exclusively.

SEC. 2. *And be it further resolved*, That Congress may at any time alter or amend this joint resolution, having due regard to the rights of said company, and any other parties.

Approved, May 31, 1870.

ACT OF FEBRUARY 27, 1873.

17 Stat., 477. CHAP. CCVII.—An Act to authorize the Northern Pacific Railroad Company to construct and maintain a Bridge across the Saint Louis River.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Northern Pacific Railroad Company is hereby authorized to construct and maintain a draw-bridge across the Saint Louis river between Rice's Point, in the State of Minnesota, and Connor's Point, in the State of Wisconsin. That the said bridge shall be not less than ten feet above the level of the water of said river at the point where its construction is hereby authorized; that said bridge shall have a pivot-draw giving two clear openings of one hundred feet each, measured at right angles to the current at the average stage of water in the river, and located in a part of the bridge that can be safely and conveniently reached at that stage; and the next adjoining spans to the draw shall not be less than one hundred and fifty feet, if the proper location of the draw over the channel will admit spans of this width between it and the shore; and said span shall not be less than ten feet above extreme high-water mark, measuring to the bottom chord of the bridge; that said draw shall be opened promptly, upon reasonable signal, for the passage of boats whose construction shall not be such as to admit of their passage under the stationary spans of said bridge, except when trains are passing over the same; but in no case shall unnecessary delay occur in opening the said draw before or after the passage of trains.

SEC. 2. That the piers of the said bridge shall be built parallel with the current at that stage of the river which is most important for navigation; and that no ripraps or other outside protection for imperfect foundation will be permitted in the channel-way of the draw-openings.

SEC. 3. That the said Northern Pacific Railroad Company shall submit to the Secretary of War, for his examination, a design and drawings of the bridge and piers, and a map of the location, giving, for the space of at least one mile above and one mile below the proposed location, the topography of the banks of the river, the shore-lines at high and low water, the direction of the current at all stages, and the soundings accurately showing the bed of the stream, the location of any other bridge or bridges, and shall furnish such other information as may be required for a full and satisfactory understanding of the subject by the Secretary of War; and if the Secretary of War is satisfied that the provisions of the law have been complied with in regard to location, the building of the piers may be at once commenced; but if it shall appear that the conditions prescribed by this act cannot be complied with at the location where it is desired to construct the bridge, the Secretary of War shall, after considering any remonstrances filed against the building of said bridge, and furnishing copies of such remonstrances to the board of engineers provided for in this act, detail a board composed of three experienced officers of the Corps of Engineers, to examine the case, and, on their recommendation, authorize such modifications in the requirements of this act, as to location and piers, as will permit the construction of the bridge, not, however, diminishing the width of the spans contemplated by this act: *Provided*, That the free navigation of the river be not materially injured thereby.

SEC. 4. That all parties owning, occupying, or operating the said bridge shall maintain, at their own expense, from sunset to sunrise throughout the year, such lights on their bridges as may be required by the light-house board for the security of navigation; and all persons owning, occupying or operating the said bridge shall, in any event, maintain all lights on their bridge that may be necessary for the security of navigation.

SEC. 5. That any bridge constructed under this act, and according to its limitations, shall be a lawful structure, and shall be recognized and known as a post-route, upon which, also, no higher charge shall be made for the transmission over the same of the mails, the troops, and the munitions of war of the United States than the rate per mile paid for the transportation over the railroads or public highways leading to said bridge; and the United States shall have the right of way for postal-telegraph purposes across such bridge; and in case of any litigation arising from any obstruction or alleged obstruction to the navigation of said river, created by the construction of said bridge under this act, the cause or question arising may be tried before the district court of the

Authorized to construct a draw-bridge across the St. Louis River.

No riprapping to be permitted for piers in channel-way.

Plans and maps to be submitted to the Secretary of War.

Under certain circumstances the Secretary of War shall detail a board of three officers of the engineering corps to examine the case.

Lights, as may be required by the Light-House Board, shall be maintained on the bridge.

Bridge shall be a lawful structure and a post-route without extra charge for Government transportation.

United States reserves the right of way for postal-telegraph purposes across such bridge.

United States of any State in which any portion of said obstruction or bridge touches.

SEC. 6. That all railway companies desiring to use the said bridge shall have and be entitled to equal rights and privileges in the passage of the same, and in the use of the machinery and fixtures thereof, and of all the approaches thereto, under and upon such terms and conditions as shall be prescribed by the Secretary of War, upon hearing the allegations and proofs of the parties in case they shall not agree.

All railway companies may use the bridge.

Terms and conditions of such use.

SEC. 7. That the right to alter or amend this act, so as to prevent or remove all material obstructions to the navigation of said river by the construction of the said bridge, is hereby expressly reserved, without any liability of the government for damages on account of the alteration or amendment of this act, or on account of the prevention or requiring the removal of any such obstructions; and if any change be made in the plan of construction of any bridge constructed under this act, during the progress of the work thereon or before the completion of said bridge, such change shall be subject to the approval of the Secretary of War; and any change in the construction, or any alteration of said bridge that may be directed at any time by Congress, shall be made at the cost and expense of the owners thereof.

Right to alter or amend reserved.

Any change in construction subject to approval of the Secretary of War.

Approved, February 27, 1873.

LAWS RELATING TO THE ATLANTIC AND PACIFIC RAILROAD.

Subject.	Date of approval.	United States Statutes.	
		Vol.	Page.
Charter act	July 27, 1866	14	292
Reports (repealed)	July 25, 1868	15	79
Mortgage authorized	Apr. 20, 1871	17	19

ACT OF JULY 27, 1866.

CHAP. CCLXXVIII.—An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the States of Missouri and Arkansas to the Pacific Coast.

14 Stat., 292.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That John B. Brown, Anson P. Morrill, Samuel F. Hersey, William G. Crosby, Samuel E. Spring, Samuel P. Dinsmore, of Maine; N. S. Upham, Frederick Smyth, Onslow Stearns, S. G. Griffin, William E. Chandler, of New Hampshire; T. W. Parke, H. H. Baxter, John Gregory Smith, A. P. Lyman, of Vermont; Walter S. Burges, William S. Slater, Stephen Harris, Thomas P. Shepard, of Rhode Island; William Merritt, Alexander H. Bullock, George L. Stearns, Genery Twitchell, Charles H. Warren, Chester W. Chapin, of Massachusetts; John Boyd, Robert C. Wetmore, John T. Wait, Cyrus Northrop, of Connecticut; Solon Humphreys, J. Bigler, Homer Ramsdell, Isaac H. Knox, John A. C. Gray, Daniel L. Ross, A. V. Stout, M. K. Jessup, R. E. Fenton, E. L. Fancher, J. C. Fremont, James Hoy, Jesse M. Bolles, Edward Gilbert, James P. Robinson, Oliver C. Billings, of New York; Charles Bachelor, John Edgar Thompson, Morton McMichael, T. Haskins Du Puy, Thomas A. Scott, Charles Rickettson, William Lyon, George W. Cass, Levi Parsons, of Pennsylvania; Charles Knap, J. L. N. Stratton, James B. Dayton, Robert F. Stockton, Alexander G. Cattell, A. W. Markley, of New Jersey; John W. Garrett, Charles J. M. Gwinn, Robert Fowler, Jacob Tome, Thomas M. Lanahan, of Maryland; Charles J. Dupont, Henry Ridgley, Andrew C. Gray, Nat. Smythers, of Delaware; Bellamy Storer, George B. Senter, William Baker, Samuel Galloway, David Tod, Charles Anderson, Bird B. Chapman, Edward Sturgis, Israel Dille, of Ohio; Edwin Peck, William D. Griswold, James P. Luse, Samuel E. Perkins, Conrad Baker, of Indiana; Richard J. Oglesby, N. B. Judd, Samuel A. Buckmaster, D. L. Phillips, L. P. Sanger, of Illinois; Eber B. Ward, Omar D. Congar, Nathaniel W. Brooks, Alexander H. Morrison, of Michigan; Z. G. Simmons, Alexander Mitchell, J. J. Williams, G. A. Thompson,

*Atlantic and Pacific Railroad Company incorporated.

J. J. R. Pease, John H. Hersey, of Wisconsin; Henry A. Smith, Sherman Finch, William Mitchell, R. F. Crowell, L. F. Hubbard, E. F. Drake, of Minnesota; Lyman Cook, Platt Smith, Jacob Butler, Henry I. Reid, Hoyt Sherman, of Iowa; William G. Brownlow, of Tennessee; Thomas C. Fletcher, B. R. Bonner, John M. Richardson, Emil Pretorius, E. W. Fox, R. J. McElheny, Charles H. Howland, Madison Miller, George W. Fishback, T. J. Hubbard, George Knapp, Charles K. Dickson, A. G. Braun, G. L. Hewitt, P. A. Thompson, James W. Thomas, Charles E. Moss, Edward Walsh, A. R. Easton, Truman J. Horner, J. B. Eads, D. R. Garrison, W. A. Kayser, George P. Robinson, of Missouri; Thomas E. Bramlette, Benjamin Gratz, C. E. Warren, Lazarus W. Powell, John Mason Brown, Joshua Speed, of Kentucky; Solon Thatcher, Jacob Stotter, William B. Edwards, James G. Blunt, Robert McBratney, of Kansas; Harrison Hagaus, James Cook, Robert Crangle, Benjamin H. Smith, of West Virginia; Lorenzo Sherwood, A. J. Hamilton, of Texas; William Gilpin, Henry C. Leach, of Colorado; Phineas Banning, Timothy G. Phelps, William B. Carr, Edward F. Beale, Fred. F. Lowe, Benj. B. Redding, B. W. Hathaway, Leonidas Haskell, Frederick Billings, of California; W. S. Ladd, J. R. Moores, Walter Monteith, John Kelly, B. F. Dowell, of Oregon; James L. Johnson, Henry Connelly, Franciscus Perea, of New Mexico; J. H. Mills, A. P. K. Safford, E. S. Davis, of Nevada; King S. Woolsey, William H. Hardy, Coles Bashford, of Arizona; Henry D. Cooke, of the District of Columbia; and all such other persons who shall or may be associated with them, and their successors, are hereby created and erected into a body corporate and politic, in deed and in law, by the name, style, and title of the "Atlantic and Pacific Railroad Company," and by that name shall have perpetual succession, and shall be able to sue and be sued, plead and be impleaded, defend and be defended, in all courts of law and equity within the United States, and may make and have

Name.

Empowered to lay out, construct and enjoy a continuous railroad and telegraph line.

From Springfield, Mo., via Albuquerque, N. M., along the 25th parallel of latitude, to the Pacific.

Right to construct a branch from Canadian River to a point near Van Buren, Ark.

Capital stock, \$100,000,000.

Board of commissioners appointed.

First meeting of commissioners to be held in St. Louis, Mo.

Organization of board.

And said corporation is hereby authorized and empowered to lay out, locate, and construct, furnish, maintain, and enjoy, a continuous railroad and telegraph line, with the appurtenances, namely: Beginning at or near the town of Springfield, in the State of Missouri, thence to the western boundary line of said State, and thence by the most eligible railroad route as shall be determined by said company to a point on the Canadian River, thence to the town of Albuquerque, on the River Del Norte, and thence, by way of the Agua Frio, or other suitable pass, to the head-waters of the Colorado Chiquito, and thence, along the thirty-fifth parallel of latitude, as near as may be found most suitable for a railway route, to the Colorado River, at such point as may be selected by said company for crossing; thence by the most practicable and eligible route, to the Pacific. The said company shall have the right to construct a branch from the point at which the road strikes the Canadian River eastwardly, along the most suitable route as selected, to a point in the western boundary line of Arkansas, at or near the town of Van Buren. And the said company is hereby vested with all the powers, privileges, and immunities necessary to carry into effect the purposes of this act, as herein set forth. The capital stock of said company shall consist of one million shares of one hundred dollars each, which shall in all respects be deemed personal property, and shall be transferable in such manner as the laws of said corporation shall provide. The persons hereinbefore named are hereby appointed commissioners, and shall be called the board of commissioners of the "Atlantic and Pacific Railroad Company," and fifteen shall constitute a quorum for the transaction of business. The first meeting of said board of commissioners shall be held at the Turner Hall, in the city of Saint Louis, on the first day of October, anno Domini eighteen hundred and sixty-six, or at such time within three months thereafter as any ten commissioners herein named from Missouri shall appoint, notice of which shall be given by them to the other commissioners by publishing said notice in at least one daily newspaper in the cities of Boston, New York, Cincinnati, Saint Louis, Memphis, and Nashville, once a week for at least four weeks previous to the day of meeting. Said board shall organize by the choice from its number of a president, vice-president, secretary, and treasurer, and they shall require from said treasurer such bonds as may be deemed proper, and may from time to time increase the amount thereof, as they may deem proper. The secretary shall be sworn to the faithful performance of his duties, and such oath shall be

entered upon the records of the company, signed by him, and the oath verified thereon. The president and secretary of said boards shall, in like manner, call other meetings, naming the time and place thereof. It shall be the duty of said board of commissioners to open books, or cause books to be opened, at such times and in such principal cities or other places in the United States as they or a quorum of them shall determine, within twelve months after the passage of this act, to receive subscriptions to the capital stock of said corporation, and a cash payment of ten per centum on all subscriptions, and to receipt therefor. So soon as ten thousand shares shall in good faith be subscribed for, and ten dollars per share actually paid into the treasury of the company, the said president and secretary of said board of commissioners shall appoint a time and place for the first meeting of the subscribers to the stock of said company, and shall give notice thereof in at least one newspaper in each State in which subscription books have been opened, at least fifteen days previous to the day of meeting, and such subscribers as shall attend the meeting so called, either in person or by lawful proxy, then and there shall elect, by ballot, thirteen directors for said corporation; and in such election each share of said capital stock shall entitle the owner thereof to one vote. The president and secretary of the board of commissioners, and in case of their absence or inability any two of the officers of said board, shall act as inspectors of said election, and shall certify, under their hands, the names of the directors elected at said meeting. And the said commissioners, treasurer, and secretary shall then deliver over to said directors all the moneys, properties, subscription books, and other books in their possession, and thereupon the duties of said commissioners and the officers previously appointed by them shall cease and determine forever, and thereafter the stockholders shall constitute said body politic and corporate. Annual meetings of the stockholders of the said corporation for the choice of officers, (when they are to be chosen), and for the transaction of business, shall be holden at such time and place and upon such notice as may be prescribed in the by-laws.

President and Secretary to call other meetings.
Duty of the board of commissioners to open books for subscriptions to stock.

First meeting of subscribers to stock.

Thirteen directors to be elected by stockholders.

Commissioners to deliver over to the directors all the moneys, properties, books, &c.

Annual meetings of stockholders.

Sec. 2. *And be it further enacted*, That the right of way through the public lands be, and the same is hereby, granted to the said Atlantic and Pacific Railroad Company, its successors and assigns, for the construction of a railroad and telegraph as proposed; and the right, power, and authority is hereby given to said corporation to take from the public lands adjacent to the line of said road material of earth, stone, timber, and so forth, for the construction thereof. Said way is granted to said railroad to the extent of one hundred feet in width on each side of said railroad where it may pass through the public domain, including all necessary grounds for station-buildings, workshops, depots, machine-shops, switches, side-tracks, turn-tables, and water-stations; and the right of way shall be exempt from taxation within the Territories of the United States. The United States shall extinguish, as rapidly as may be consistent with public policy and the welfare of the Indians, and only by their voluntary cession, the Indian title to all lands falling under the operation of this act and acquired in the donation to the road named in the act.

Grant of right of way.

Authority to take from adjacent lands materials for construction.

Right of way 100 feet in width on each side of said railroad.

Right of way exempt from taxation.

Indian titles to be extinguished by the United States.

Grant of lands

Sec. 3. *And be it further enacted*, That there be, and hereby is, granted to the Atlantic and Pacific Railroad Company, its successors and assigns, for the purpose of aiding in the construction of said railroad and telegraph line to the Pacific Coast, and to secure the safe and speedy transportation of the mails, troops, munitions of war, and public stores, over the route of said line of railway and its branches, every alternate section of public land, not mineral, designated by odd numbers, to the amount of twenty alternate sections per mile, on each side of said railroad line, as said company may adopt, through the Territories of the United States, and ten alternate sections of land per mile on each side of said railroad whenever it passes through any State, and whenever, on the line thereof, the United States have full title, not reserved, sold, granted, or otherwise appropriated, and free from pre-emption or other claims or rights, at the time the line of said road is designated by a plat thereof, filed in the office of the commissioner of the General Land-Office; and whenever, prior to said time, any of said sections or parts of sections shall have been granted, sold, reserved, occupied by homestead settlers, or pre-empted, or otherwise disposed of, other lands shall be selected by said company in lieu thereof, under the direction of the Secretary of the Interior, in alternate sections, and

Forty sections per mile in the Territories.

Twenty sections per mile in the States.

Other lands may be selected in lieu of those reserved.

Land limits.

If route is upon the line of any other aided road former grant shall be deducted.

Road having previous grant may assign.

"Mineral" lands not granted.

Agricultural lands in lieu of mineral lands.

"Mineral" does not include iron or coal.

The President to appoint three Commissioners to examine road.

Commissioners to report, under oath, to the President.

Road to be constructed as a "first-class" railroad.

Rails to be of American iron. Gauge to be uniform.

Telegraph line. Condition as to charges for Government transportation and telegraphic service.

Other roads may form running connections on equitable terms.

Land to be surveyed as fast as construction of road may require.

designated by odd numbers, not more than ten miles beyond the limits of said alternate sections, and not including the reserved numbers: *Provided*, That if said route shall be found upon the line of any other railroad route, to aid in the construction of which lands have been heretofore granted by the United States, as far as the routes are upon the same general line, the amount of land heretofore granted shall be deducted from the amount granted by this act: *Provided further*, That the railroad company receiving the previous grant of land may assign their interest to said "Atlantic and Pacific Railroad Company," or may consolidate, confederate, and associate with said company upon the terms named in the first and seventeenth sections of this act: *Provided further*, That all mineral lands be, and the same are hereby, excluded from the operations of this act, and in lieu thereof a like quantity of unoccupied and unappropriated agricultural lands in odd-numbered sections nearest to the line of said road, and within twenty miles thereof, may be selected as above provided: *And provided further*, That the word "mineral," when it occurs in this act, shall not be held to include iron or coal: *And provided further*, That no money shall be drawn from the treasury of the United States to aid in the construction of the said "Atlantic and Pacific Railroad."

SEC. 4. *And be it further enacted*, That whenever said Atlantic and Pacific Railroad Company shall have twenty-five consecutive miles of any portion of said railroad and telegraph line ready for the service contemplated, the President of the United States shall appoint three commissioners to examine the same, who shall be paid a reasonable compensation for their services by the company, to be determined by the Secretary of the Interior; and if it shall appear that twenty-five consecutive miles of said road and telegraph line have been completed in a good, substantial and workman-like manner, as in all other respects required by this act, the commissioners shall so report under oath, to the President of the United States, and patents of lands, as aforesaid, shall be issued to said company, confirming to said company the right and title to said lands situated opposite to and coterminous with said completed section of said road. And from time to time, whenever twenty-five additional consecutive miles shall have been constructed, completed, and in readiness as aforesaid, and verified by said commissioners to the President of the United States, then patents shall be issued to said company conveying the additional sections of land as aforesaid, and so on as fast as every twenty-five miles of said road is completed as aforesaid.

SEC. 5. *And be it further enacted*, That said Atlantic and Pacific Railroad shall be constructed in a substantial and workman-like manner, with all the necessary draws, culverts, bridges, viaducts, crossings, turn-outs, stations, and watering-places, and all other appurtenances, including furniture and rolling-stock, equal in all respects to railroads of the first class when prepared for business, with rails of the best quality, manufactured from American iron. And a uniform gauge shall be established throughout the entire length of the road. And there shall be constructed a telegraph line, of the most substantial and approved description, to be operated along the entire line: *Provided*, That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service. And it shall be the duty of the Atlantic and Pacific Railroad Company to permit any other railroad which shall be authorized to be built by the United States, or by the legislature of any Territory or State in which the same may be situated, to form running connections with it, on fair and equitable terms.

SEC. 6. *And be it further enacted*, That the President of the United States shall cause the lands to be surveyed for forty miles in width on both sides of the entire line of said road after the general route shall be fixed, and as fast as may be required by the construction of said railroad; and the odd sections of land hereby granted shall not be liable to sale or entry, or pre-emption, before or after they are surveyed, except by said company, as provided in this act; but the provisions of the act of September, eighteen hundred and forty-one, granting pre-emption rights, and the acts amendatory thereof, and of the act entitled "An act to secure homesteads to actual settlers on the public domain," approved May twenty, eighteen hundred and sixty-two, shall be, and the same are hereby, extended to all other lands on the line of said road when surveyed, excepting those hereby granted to said company.

SEC. 7. *And be it further enacted*, That the said Atlantic and Pacific Railroad Company be, and is hereby, authorized and empowered to enter upon, purchase, take, and hold any lands or premises that may be necessary and proper for the construction and working of said road, not exceeding in width one hundred feet on each side of the line of its railroad, unless a greater width be required for the purpose of excavation or embankment; and also any lands or premises that may be necessary and proper for turn-outs, standing places for cars, depots, station-houses, or any other structures required in the construction and working of said road. And the said company shall have the right to cut and remove trees and other material that might, by falling, incumber its road-bed, though standing or being more than two hundred feet from the line of said road. And in case the owner of such lands or premises and the said company cannot agree as to the value of the premises taken, or to be taken, for the use of said road, the value thereof shall be determined by the appraisal of three disinterested commissioners, who may be appointed upon application by either party to any court of record in any of the Territories in which the lands or premises to be taken lie; and said commissioners, in their assessment of damages, shall appraise such premises at what would have been the value thereof if the road had not been built. And upon return into court of such appraisal, and upon the payment into the same of the estimated value of the premises taken for the use and benefit of the owner thereof, said premises shall be deemed to be taken by said company, which shall thereby acquire full title to the same for the purposes aforesaid. And either party feeling aggrieved at said appraisal may, within thirty days after the same has been returned into court, file an appeal therefrom, and demand a jury of twelve men to estimate the damage sustained; but such appeal shall not interfere with the rights of said company to enter upon the premises taken, or to do any act necessary and proper in the construction of its road. And said party appealing shall give bonds, with sufficient surety or sureties, for the payment of any cost that may arise upon such appeal; and in case the party appealing does not obtain a verdict more favorable, such party shall pay the whole cost incurred by the appellee, as well as his own, and the payment into court, for the use of the owner of said premises taken, at a sum equal to that finally awarded, shall be held to vest in said company the title of said land, and the right to use and occupy the same for the construction, maintenance, and operation of said road. And in case any of the lands to be taken as aforesaid shall be held by an infant, femme covert, non compos, insane person, or persons residing without the territory within which the lands to be taken lie, or persons subjected to any legal disability, the court may appoint a guardian, for any party under any disqualification, to appear in proper person, who shall give bonds, with sufficient surety or sureties, for the proper and faithful execution of his trust, and who may represent in court the person disqualified, as aforesaid, from appearing, when the same proceedings shall be had in reference to the appraisal of the premises to be taken for the use of said company, and with the same effect as has been already described; and the title of the company to the lands taken by virtue of this act shall not be affected or impaired by reason of any failure by any guardian to discharge faithfully his trust. And in case any party shall have a right or claim to any land for a term of years, or any interest therein, in possession, reversion, or remainder, the value of any such estate, less than a fee simple, shall be estimated and determined in the manner hereinbefore set forth. And in case it shall be necessary for the company to enter upon any lands which are unoccupied, and of which there is no apparent owner or claimant, it may proceed to take and use the same for the purposes of said railroad, and may institute proceedings, in manner described, for the purpose of ascertaining the value of, and of acquiring a title to, the same; but the judge of the court hearing said suit shall determine the kinds of notice to be served on such owner or owners, and he may in his discretion appoint an agent or guardian to represent such owner or owners in case of his or their incapacity or non-appearance. But in case no claimant shall appear within six years from the time of the opening of said road across any land, all claims to damages against said company shall be barred.

Authorizes company to take any lands necessary for construction of its road. 100 feet on each side.

Lands for turn-outs, depots, &c.

Damages to be determined by commissioners.

Procedure.

What proceedings in cases of lands held by any persons subject to any legal disability.

Other proceedings.

Proceedings when lands are unoccupied.

Claims barred if not made within six years.

SEC. 8. *And be it further enacted*, That each and every grant, right, and privilege herein are so made and given to and accepted by said Atlantic and Pacific Railroad Company, upon and subject to the following conditions.

Grants made subject to certain conditions.

Whole road to be completed by July 4, 1878.

Congress may do anything necessary to insure a speedy completion of the road.

All people of the United States may subscribe to the stock until whole amount is taken up.

To be a post-route and military road.

Congress may restrict charges for government transportation.

Company to accept terms, conditions, &c., within two years.

Annual report to be verified by affidavits of President and six directors of company.

Election of President and Vice-president from board of directors.

Treasurer and Secretary.

Term of office of President, Vice-president, and directors not to exceed three years.

Directors empowered to make by-laws, rules, and regulations.

Directors may fill vacancies in board.

ing conditions, namely: That the said company shall commence the work on said road within two years from the approval of this act by the President, and shall complete not less than fifty miles per year after the second year, and shall construct, equip, furnish, and complete the main line of the whole road by the fourth day of July, anno Domini eighteen hundred and seventy-eight.

SEC. 9. *And be it further enacted*, That the United States make the several conditional grants herein, and that the said Atlantic and Pacific Railroad Company accept the same, upon the further condition that if the said company make any breach of the conditions hereof, and allow the same to continue for upwards of one year, then, in such case, at any time hereafter, the United States may do any and all acts and things which may be needful and necessary to insure a speedy completion of the said road.

SEC. 10. *And be it further enacted*, That all people of the United States shall have the right to subscribe to the stock of the Atlantic and Pacific Railroad Company until the whole capital named in this act of incorporation is taken up by complying with the terms of subscription.

SEC. 11. *And be it further enacted*, That said Atlantic and Pacific Railroad, or any part thereof, shall be a post route and military road, subject to the use of the United States for postal, military, naval, and all other government service, and also subject to such regulations as Congress may impose restricting the charges for such government transportation.

SEC. 12. *And be it further enacted*, That the acceptance of the terms, conditions, and impositions of this act by the said Atlantic and Pacific Railroad Company shall be signified in writing under the corporate seal of said company, duly executed pursuant to the direction of its board of directors first had and obtained, which acceptance shall be made within two years after the passage of this act, and not afterwards, and shall be deposited in the office of the Secretary of the Interior.

SEC. 13. *And be it further enacted*, That the directors of said company shall make and publish an annual report of their proceedings and expenditures, verified by the affidavits of the president and at least six of the directors, a copy of which shall be deposited in the office of said Secretary of the Interior, and they shall, from time to time, fix, determine, and regulate the fares, tolls, and charges to be received and paid for transportation of persons and property on said road, or any part thereof.

SEC. 14. *And be it further enacted*, That the directors chosen in pursuance of the first section of this act shall, so soon as may be after their election, elect from their own number a president and vice-president; and said board of directors shall, from time to time, and so soon as may be after their election, choose a treasurer and secretary, who shall hold their offices at the will and pleasure of the board of directors. The treasurer and secretary shall give such bonds, with such security as the said board from time to time may require. The secretary shall, before entering upon his duty, be sworn to the faithful discharge thereof, and said oath shall be made a matter of record upon the books of said corporation. No person shall be a director of said company unless he shall be a stockholder, and qualified to vote for directors at the election at which he shall be chosen.

SEC. 15. *And be it further enacted*, That the president, vice-president, and directors shall hold their offices for the period indicated in the by-laws of said company, not exceeding three years, respectively, and until others are chosen in their place, and qualified. In case it shall so happen that an election of directors shall not be made on any day appointed by the by-laws of said company, the corporation shall not for that excuse be deemed to be dissolved, but such election may be holden on any day which shall be appointed by the directors. The directors, of whom seven, including the president, shall be a quorum for the transaction of business, shall have full power to make and prescribe such by-laws, rules, and regulations as they shall deem needful and proper touching the disposition and management of stock, property, estate, and effects of the company, the transfer of shares, the duties and conduct of their officers and servants touching the election and meeting of the directors, and all matters whatsoever which may appertain to the concerns of said company; and the said board of directors may have full power to fill any vacancy or vacancies that may occur from any cause or causes from time to time in their said board. And the said

board of directors shall have power to appoint such engineers, agents, and subordinates as may from time to time be necessary to carry into effect the object of the company, and to do all acts and things touching the location and construction of said road.

SEC. 16. *And be it further enacted,* That it shall be lawful for the directors of said company to require payment of the sum of ten per centum cash assessment upon all subscriptions received of all subscribers, and the balance thereof at such times and in such proportions and on such conditions as they shall deem to be necessary to complete the said road and telegraph lines within the time in this act prescribed. Sixty days' previous notice shall be given of the payments required, and of the time and place of payment, by publishing a notice once a week in one daily newspaper in each of the cities of Boston, New York, Cincinnati, St. Louis, Memphis, and Nashville, and in case any stockholder shall neglect or refuse to pay, in pursuance of such notice, the stock held by such person shall be forfeited absolutely to the use of the company, and also any payment or payments that shall have been made on account thereof, subject to the condition that the board of directors may allow the redemption on such terms as they may prescribe.

SEC. 17. *And be it further enacted,* That the said company is authorized to accept to its own use any grant, donation, loan, power, franchise, aid or assistance which may be granted to or conferred on said company by the Congress of the United States, by the legislature of any State, or by any corporation, person, or persons, or by any Indian tribe or nation through whose reservation the road herein provided for may pass; and said corporation is authorized to hold and enjoy any such grant, donation, loan, power, franchise, aid, or assistance, to its own use, for the purpose aforesaid: *Provided,* That any such grant or donation, power, aid, or assistance from any Indian tribe or nation shall be subject to the approval of the President of the United States.

SEC. 18. *And be it further enacted,* That the Southern Pacific Railroad, a company incorporated under the laws of the State of California, is hereby authorized to connect with the said Atlantic and Pacific Railroad, formed under this act, at such point, near the boundary line of the State of California, as they shall deem most suitable for a railroad line to San Francisco, and shall have a uniform gauge and rate of freight or fare with said road; and in consideration thereof, to aid in its construction, shall have similar grants of land, subject to all the conditions and limitations herein provided, and shall be required to construct its road on the like regulations, as to time and manner, with the Atlantic and Pacific Railroad herein provided for.

SEC. 19. *And be it further enacted,* That unless the said Atlantic and Pacific Railroad Company shall obtain bona fide subscriptions to the stock of said company to the amount of one million of dollars, with ten per centum paid, within two years after the passage of and approval of this act, it shall be null and void.

SEC. 20. *And be it further enacted,* That the better to accomplish the object of this act, namely, to promote the public interest and welfare by the construction of said railroad and telegraph line, and keeping the same in working order, and to secure to the government at all times, but particularly in time of war, the use and benefits of the same for postal, military, and other purposes, Congress may, at any time, having due regard for the rights of said Atlantic and Pacific Railroad Company, add to, alter, amend, or repeal this act.

SEC. 21.* *And be it further enacted,* That whenever in any grant of land or other subsidies, made or hereafter to be made, to railroads or other corporations, the United States has reserved the right, or shall reserve it, to appoint directors, engineers, commissioners or other agents to examine said roads, or act in conjunction with other officers of said company or companies, all the costs, charges, and pay of said directors, engineers, commissioners, or agents, shall be paid by the respective companies. Said directors, engineers, commissioners, or agents shall be paid day and ten cents for said services the sum of ten dollars per day, for each and every day actually and necessarily employed, and ten cents per mile for each and every mile actually and necessarily traveled, in discharging the duties required of them, which per diem and mileage shall be in full compensation for said services. And in case any company shall refuse or neglect to make such payments, no more patents for lands or other subsidies shall be issued to said company until these requirements are complied with.

Approved, July 27, 1866.

Directors empowered to appoint engineers, agents, &c.

Directors to require payment of ten per centum cash assessment, and balance of subscriptions when needed.

Forfeited stock may be redeemed on terms prescribed by directors.

Company authorized to accept other grants, franchises, &c.

Grant from any Indian tribe to be subject to the approval of the President.

Southern Pacific may connect with the Atlantic and Pacific Railroad. Point of connection to be near the boundary line of California.

Uniform gauge and rate of freight and fare.

Shall have similar grants of land, &c.

This act to be null and void, unless one million of dollars of stock are subscribed for within two years.

Congress may add to, alter, amend, or repeal this act, having due regard for the rights of the company.

Compensation of Directors, Engineers, Commissioners, &c., to be paid by railroad companies.

Ten dollars per day and ten cents per mile.

If company neglects to make such payments, patents for lands not to be issued.

(Repealed.)

ACT OF JUNE 25, 1868.

15 Stat., 79.

CHAP. LXXVII.—An act relative to filing reports of railroad companies.

(Printed with laws relating to the Northern Pacific.)

ACT OF APRIL 20, 1871.

17 Stat., 19.

CHAP. XXXIII.—An Act to enable the Atlantic and Pacific Railroad Company to mortgage its Road.

The Atlantic and Pacific Railroad Company authorized to issue its bonds.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Atlantic and Pacific Railroad Company, organized under act of Congress of July twenty-seven, eighteen hundred and sixty-six, is hereby authorized to make and issue its bonds in such form and manner, and for such sums, payable at such times, and bearing such rate of interest, and to dispose of them on such terms as its directors may deem advisable; and to secure said bonds, the said company may mortgage its road, equipment, lands, franchises, privileges, and other rights and property, subject to such terms, conditions, and limitations as its directors may prescribe. As proof and notice of the legal execution and effectual delivery of any mortgage hereafter made by said company, it shall be filed and recorded in the office of the Secretary of the Interior: *Provided*, That if the company shall hereafter suffer any breach of the conditions of the act above referred to, under which it is organized, the rights of those claiming under any mortgage made by the company to the lands granted to it by said act shall extend only to so much thereof as shall be coterminous with or appertaining to that part of said road which shall have been constructed at the time of the foreclosure of said mortgage.

Approved, April 20, 1871.

LAWS RELATING TO THE TEXAS AND PACIFIC RAILWAY.

Subject.	Date of approval.	United States Statutes.	
		Vol.	Page.
Charter act	Mar. 3, 1871	16	365
Name of company changed	May 2, 1872	17	59
Former mortgages legalized	Mar. 3, 1873	17	598
Authorized to secure construction bonds by new mortgage	June 22, 1874	18	197

ACT OF MARCH 3, 1871.

16 Stat., 573.

CHAP. CXVII.—An Act to incorporate the Texas Pacific Railroad Company, and to aid in the Construction of its Road, and for other Purposes.

Texas Pacific Railroad Company incorporated.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That John C. Fremont, James L. Alcorn, G. M. Dodge, O. C. French, John D. Caldwell, J. J. Noah, A. C. Osborne, Timothy Hurley, C. C. Pool, Silas N. Martin, John M. Corse, George E. Wentworth, Philip H. Morgan, J. D. Cameron, Marshal O. Roberts, James L. Hodges, John Ray, W. Vermilye, Enoch L. Faucher, Charles F. Livermore, Joseph H. Oglesby, John Whytock, Daniel Drew, F. S. Davis, W. Orton, A. C. Babcock, Thomas A. Scott, Samuel D. Hoffman, H. Ramsdale, William H. Jackson, R. C. Parsons, Delos W. Emmons, M. A. Southworth, John H. Hall, G. C. Kinzey, W. P. Clark, James Dart, H. Jacobs, L. T. Smith, W. P. Dole, C. A. Weed, A. P. K. Safford, H. McCullough, Charles Jackson, Elisha Dyer, Alfred Anthony, James Hoy, M. W. Benjamin, H. D. Cooke, Joseph R. West, W. S. Huntington, J. M. Tebbetts, C. C. Leondridge, D. D. Porter, M. Woodhull,

Hiram Price, M. C. Hunter, W. T. Walters, J. B. Brownlow, T. A. Morris, Owen Tuller, J. H. Ledlie, R. M. Bishop, Samuel Craighead, D. N. Stanton, Augustus H. Whiting, G. L. Johnston, J. W. Goodland, Powell Clayton, Samuel Tate, W. Bolton, H. Robinson, George Maney, O. H. Bynum, M. Burns, J. C. Goodloe, E. G. Barney, Cyrus Busey, J. W. Forney, J. Lockwood, E. M. Davis, N. Patton, W. Flanagan, G. O'Brien, G. P. Buel, G. H. Gidding, J. J. Newell, E. W. Rice, R. M. Shoemaker, Samuel Sloan, S. W. Morton, J. B. Bowman, L. M. Flournoy, J. J. Hinds, G. R. Weeks, J. T. Lindling, B. C. Gilbert, B. D. Williams, Thomas Olcott, G. A. Foadick, Harry Hays, P. S. Forbes, John T. Sprague, L. R. Marsh, A. W. Beckwith, J. C. Stanton, Cyrus H. Baldwin, A. J. Hamilton, Rush R. Sloan, Silas C. Colgrove, Samuel D. Jones, N. H. Decker, William N. Leet, B. F. Allen, J. B. Chaves, Augustus Kountze, John N. Goodwin, William S. Rosecrans, Michael Hahn, H. C. Warmouth, J. S. Williams, G. M. Spencer, L. J. Higby, W. C. Kimball, and all such persons as shall or may be associated with them, and their successors, are hereby created a body politic and corporate in fact and in law, by the name, style, and title of the Texas Pacific Railroad Company, and by that name shall have perpetual succession, and shall be able to sue and be sued, plead and be impleaded, defend and be defended, in all courts of law and equity within the United States, and may make and use a common seal; and the said corporation is hereby authorized and empowered to lay out, locate, construct, furnish, maintain, and enjoy a continuous railroad and telegraph line, with the appurtenances, from a point at or near Marshall, county of Harrison, State of Texas; thence by the most direct and eligible route, to be determined by said company, near the thirty-second parallel of north latitude, to a point at or near El Paso; thence by the most direct and eligible route, to be selected by said company, through New Mexico and Arizona, to a point on the Rio Colorado, at or near the southeastern boundary of the State of California; thence by the most direct and eligible route to San Diego, California, to ship's channel, in the bay of San Diego, in the State of California, pursuing in the location thereof, as near as may be, the thirty-second parallel of north latitude, and is hereby vested with all the powers, privileges, and immunities necessary to carry into effect the purposes of this act.

Name.

Empowered to lay out, construct, and enjoy a continuous railroad and telegraph line from Marshall, Tex., by a route near the 32d parallel of north latitude, through New Mexico and Arizona to San Diego, Cal.

SEC. 2. That the persons named in the first section of this act shall constitute a board of commissioners, (twenty of whom shall constitute a quorum for the transaction of business,) to be known as the Texas Pacific Railroad commissioners, who shall meet in the city of New York within ninety days after the passage of this act, at a time to be designated in a notice to be signed by the person first named in the list of incorporators and six of his associates, and to be published for two weeks in, at least, one daily newspaper in New York, New Orleans, and Washington; and, when so met, they may cause books to be opened for the subscription of the capital stock of said company, and when twenty thousand shares, amounting to two millions of dollars, shall have been subscribed, and ten per centum actually paid thereon, in money, to the treasurer, to be elected by said commissioners, who shall give bond for its safe keeping and payment to the treasurer of the company when organized, then it shall be lawful for such subscribers or stockholders, or a majority thereof, to organize said company in accordance with the provisions of this act, and to elect not less than seven nor more than seventeen directors, a majority of whom shall be necessary to the transaction of business, and who shall hold their offices for one year and until their successors shall be elected and qualified; and the said directors shall immediately proceed to elect a president, vice-president, secretary, and treasurer; the president and vice-president shall be directors. At all elections for directors, each share of stock shall be entitled to one vote, which may be given by the holders in person, or by proxy, who shall also be a shareholder. The directors shall hold their offices for any term not exceeding three years, as may be provided in the by-laws; and the annual meeting of stockholders shall take place as provided for in said by-laws.

Board of commissioners constituted.

To meet in the city of New York.

Subscription books for capital stock to be opened.

Stockholders to organize company, when, &c. Not less than seven, nor more than seventeen directors.

Term of office one year.

Directors to elect officers.

Term of office of directors three years.

Annual meetings of stockholders.

Capital stock, \$50,000,000.

SEC. 3. That the capital stock of the Texas Pacific Railroad Company shall be fixed by the board of directors, at a sum not exceeding fifty millions of dollars, in shares of one-hundred dollars; and when the amount is so fixed it shall never be increased except by consent of Congress. Assessments upon said stock shall only be made by a majority vote of the whole number of directors at a regular meeting, which said assess-

Stock not to be increased without consent of Congress.

ment shall be paid at the expiration of thirty days after a given notice in one newspaper in each of the cities of Washington, Philadelphia, New York, and New Orleans.

Authority to purchase property of, and to consolidate with any railroad company not having a competing through line. SEC. 4. That the said Texas Pacific Railroad Company shall have power and lawful authority to purchase the stock, land grants, franchises, and appurtenances of, and consolidate on such terms as may be agreed upon between the parties, with any railroad company or companies heretofore chartered by congressional, State, or territorial authority, on the route prescribed in the first section of this act; but no such consolidation shall be with any competing through line of railroads to the Pacific Ocean.

Authorized to make running arrangements with other companies. SEC. 5. That the said company shall have power and authority to make running arrangements with any railroad company or companies heretofore chartered, or that may hereafter be chartered by congressional, State, or territorial authority; also to purchase lands, or to accept donations, or grant of lands, or other property, from States or individuals, for the purpose of aiding in carrying out the object of this company.

Rights, franchises, &c., of purchased railroads to vest in the Texas Pacific Railroad Company. SEC. 6. That the rights, lands, land grants, franchises, privileges, and appurtenances, and property of every description, belonging to each of the consolidated or purchased railroad company or companies, as herein provided, shall vest in and become absolutely the property of the Texas Pacific Railroad Company: *Provided*, That in all contracts made and entered into by said company with any and all other railroad company or companies, to perfect such aforesaid consolidation or purchase, the indebtedness or other legal obligations of said company or companies shall be assumed by the said Texas Pacific Railroad Company as may be agreed upon, and no such consolidation or purchase shall impair any lien which may exist on any of the railroads so consolidated or purchased; but said company shall not assume the debts or obligations of any company with which it may consolidate or purchase as aforesaid, to an amount greater than the cash value of the assets received from the same.

Obligations of the other companies to be assumed. SEC. 7. That the said Texas Pacific Railroad Company shall have power to make and enforce rules and by-laws.

Prior liens not impaired. SEC. 8. That the right of way through the public lands be, and the same is hereby, granted to the said company for the construction of the said railroad and telegraph line, and the right, power, and authority is hereby given to said company to take, from the public lands adjacent to the line of said road, earth, stone, timber, and other materials for the construction thereof. Said right of way is granted to said company to the extent of two-hundred feet in width on each side of said railroad where it may pass over the public lands; and there is also hereby granted to said company grounds for stations, buildings, workshops, wharves, switches, side-tracks, turn-tables, water-station, and such other structures as may be necessary for said railroad, not exceeding forty acres of land at any one point.

Authority to make and enforce rules and by-laws. SEC. 9. That for the purpose of aiding in the construction of the railroad and telegraph line herein provided for, there is hereby granted to the said Texas Pacific Railroad Company, its successors and assigns, every alternate section of public lands, not mineral, designated by odd numbers, to the amount of twenty alternate sections per mile, on each side of said railroad line, as such line may be adopted by said company, through the Territories of the United States, and ten alternate sections of land per mile on each side of said railroad in California, where the same shall not have been sold, reserved, or otherwise disposed of by the United States, and to which a pre-emption or homestead claim may not have attached at the time the line of said road is definitely fixed. In case any of said lands shall have been sold, reserved, occupied, or pre-empted, or otherwise disposed of, other lands shall be selected in lieu thereof by said company, under the direction of the Secretary of the Interior, in alternate sections, and designated by odd numbers, not more than ten miles beyond the limits of said alternate sections first above named, and not including the reserved numbers. If, in the too near approach of the said railroad line to the boundary of Mexico, the number of sections of land to which the company is enti-

Grant of right of way. SEC. 10. That the said company shall have power and authority to take materials from adjacent lands.

Right of way 200 feet in width on each side of said railroad. SEC. 11. That the said company shall have power and authority to take materials from adjacent lands.

Grant of grounds for stations, &c., not exceeding 40 acres at any one point. SEC. 12. That the said company shall have power and authority to take materials from adjacent lands.

Grant of land. SEC. 13. That the said company shall have power and authority to take materials from adjacent lands.

40 sections per mile in the Territories. SEC. 14. That the said company shall have power and authority to take materials from adjacent lands.

20 sections per mile in California. SEC. 15. That the said company shall have power and authority to take materials from adjacent lands.

If any of the lands have been disposed of, other lands may be selected. SEC. 16. That the said company shall have power and authority to take materials from adjacent lands.

Limits, 10 miles beyond the limits of the land grant. SEC. 17. That the said company shall have power and authority to take materials from adjacent lands.

Provision as to lands not obtained by reason of the near approach of the railroad to the Mexican boundary. SEC. 18. That the said company shall have power and authority to take materials from adjacent lands.

Provision as to lands not obtained by reason of the near approach of the railroad to the Mexican boundary. SEC. 19. That the said company shall have power and authority to take materials from adjacent lands.

tled cannot be selected immediately on the line of said railroad, or in lieu of mineral lands excluded from this grant, a like quantity of unoccupied and unappropriated agricultural lands, in odd-numbered sections nearest the line of said railroad may be selected as above provided; and the word "mineral," where it occurs in this act, shall not be held to include iron or coal: *Provided, however,* That no public lands are hereby granted within the State of California further than twenty miles on each side of said road, except to make up deficiencies as aforesaid, and then not to exceed twenty miles from the lands originally granted. The term "ship's channel," as used in this bill, shall not be construed as conveying any greater right to said company to the water front of San Diego Bay than it may acquire by gift, grant, purchase, or otherwise, except the right of way, as herein granted: *And provided further,* That all such lands, so granted by this section to said company, which shall not be sold, or otherwise disposed of, as provided in this act, within three years after the completion of the entire road, shall be subject to settlement and pre-emption like other lands, at a price to be fixed by and paid to said company, not exceeding an average of two dollars and fifty cents per acre for all the lands herein granted.

SEC. 10. That when the route of said railroad and telegraph line shall pass through the lands of private persons, or where it may be necessary for said railroad company to take any lands belonging to private persons for any of the purposes herein mentioned necessary to said road, such right of way through or title to such lands shall be secured in accordance with the laws of the State or Territory in which they may be situated.

SEC. 11. That the Texas Pacific Railroad Company shall have power and authority to issue two kinds of bonds, secured by mortgage, namely: First, construction bonds; second, land bonds. Construction bonds shall be secured by mortgage, first, on all or any portion of the franchises, road-bed, or track of said railroad, and all the appurtenances thereto belonging, when constructed or in the course of construction, from a point at or near Marshall, to ship's channel, in the Bay of San Diego, in the State of California, as aforesaid. Land bonds shall be secured by mortgage, first, on all or any portion of the lands hereby granted in aid of the construction of said railroad as is provided for in this act; second, on lands acquired by any arrangement or purchase or terms of consolidation with any railroad company or companies to whom grants of land may have been made, or may hereafter be made, by any congressional, State, or territorial authority, or who may have purchased the same previous to any such arrangement or consolidation: *Provided,* That all the mortgages made and executed by said railroad company shall be filed and recorded in the Department of the Interior, which shall be a sufficient evidence of their legal execution, and shall confer all the rights and property of said company as therein expressed: *And provided also,* That the proceeds of the sales of the aforesaid construction and land bonds shall be applied only in the construction, operation, and equipment of the contemplated railroad line: *And provided further,* That said mortgage shall in no wise impair or affect any lien existing on the property of said company or companies at or before the time of such consolidation.

SEC. 12. That whenever the said company shall complete the first and each succeeding section of twenty consecutive miles of said railroad and put it in running order as a first-class road in all its appointments, it shall be the duty of the Secretary of the Interior to cause patents to be issued conveying to said company the number of sections of land opposite to and coterminous with said completed road to which it shall be entitled for each section so completed. Said company, within two years after the passage of this act, shall designate the general route of its said road, as near as may be, and shall file a map of the same in the Department of the Interior; and when the map is so filed, the Secretary of the Interior, immediately thereafter, shall cause the lands within forty miles on each side of said designated route within the Territories, and twenty miles within the State of California, to be withdrawn from pre-emption, private entry, and sale: *Provided, however,* That the provisions of the act of September, eighteen hundred and forty-one, granting pre-emption rights, and the acts amendatory thereof, and of the act entitled, "An Act to secure homesteads to actual settlers on the public domain," approved May twenty, eighteen hundred and sixty-two, and the amendments thereto, shall be, and the same are hereby, extended to all other lands of the United States on the line of said road when surveyed, except those hereby granted to said company.

"Mineral" not to include iron or coal.

Lands granted in California not further than 20 miles from the railroad, except, &c.

"Ship's channel" not to be construed as conveying special right to water front in San Diego Bay.

Lands granted and not sold or otherwise disposed of in three years to be subject to settlement, &c.

Right of way through lands of private persons to be secured in accordance with law.

Corporation authorized to issue construction bonds and land bonds, secured by mortgage.

Mortgage of road and franchises to secure "construction bonds."

Mortgage of grants and acquired lands to secure "land bonds."

All mortgages to be filed and recorded in the Department of the Interior.

Proceeds of sales of bonds to be applied only to construction, operation, and equipment of railroad.

As 20-mile sections of road are completed, patents for coterminous lands shall be issued.

General route to be designated within two years, and map filed.

Lands to be withdrawn from pre-emption, &c.

Provisions of pre-emption and homestead acts extended to other lands.

Annual report, when and where to be made, and to state what.

SEC. 13. That the president of the company shall annually, by the first day of July, make a report and file it with the Secretary of the Interior, which report shall be under oath, exhibiting the financial situation of the company, the amount of money received and expended, and the number of miles of road constructed each year; and further, the names and residences of the stockholders, of the directors, and of all other officers of the company, the amount of stock subscribed, and the amount thereof actually paid in, a description of the lines of road surveyed and fixed upon for construction, the amount received from passengers and for freight, respectively, on the road, a statement of the expenses of said road and its fixtures, and a true statement of the indebtedness of said company and the various kinds thereof.

Certificates of capital stock to be signed by the president and secretary.

SEC. 14. That the certificates of the capital stock must be signed by the president and secretary, and attested by the seal of the company, and shall contain an extract from the proceedings of the board of directors fixing the amount thereof, as well as from this act, authorizing such issue. All the bonds and mortgages issued by said company must be signed by the president and secretary, and attested by the seal of said company, and shall contain an extract from the law authorizing them to be issued. The face value of said bonds shall be one thousand dollars in gold, and shall be redeemable at such times, and to bear such rate of interest, payable semi-annually in gold, as may be determined by the directors. The total value of the construction-bonds to be issued shall not exceed thirty thousand dollars per mile of said railroad, and the total face value of the land bonds shall not exceed two dollars and fifty cents per acre for all lands mortgaged; the total amount of each to be determined by the board of directors.

Bonds and mortgages.

Bonds and interest payable in gold.

Limitation as to construction bonds, \$30,000 per mile.

Land bonds not to exceed \$2.50 per acre for all lands mortgaged.

Other railroads may connect.

No discrimination against any connecting roads.

SEC. 15. That all railroads constructed, or that may be hereafter constructed, to intersect said Texas Pacific railroad, shall have a right to connect with that line; that no discrimination as regards charges for freight or passengers, or in any other matter, shall be made by said Texas Pacific Railroad Company against any of the said connecting roads; but that the same charges per mile as to passengers, and per ton per mile as to freight, passing from the said Texas Pacific railroad over any of said connecting roads, or passing from any of said connecting roads over any part of said Texas Pacific railroad, shall be made by said company as they make for freight and passengers over their own road: *Provided also*, That said connecting roads shall reciprocate said right of connection and equality of charges with said Texas Pacific railroad; *And provided further*, That the rates charged for carrying passengers and freight, per mile, shall not exceed the prices which may be fixed by Congress for carrying passengers and freight on the Union Pacific and Central Pacific railroads.

Rates not to exceed the prices fixed by Congress on the Union and Central Pacific.

Iron or steel rails from American ore.

SEC. 16. That said road shall be constructed of iron or steel rails manufactured from American ore, except such as may have heretofore been contracted for by any railroad company which may be purchased or consolidated with by the company hereby incorporated, as provided by this act.

Corporation to commence construction of road simultaneously at San Diego and Marshall.

Fifty miles to be built within two years.

To be completed in ten years.

Upon failure, Congress may adopt measures necessary to secure speedy completion.

President to appoint one commissioner to examine sections of twenty miles as completed.

SEC. 17. That the said Texas Pacific Railroad Company shall commence the construction of its road simultaneously at San Diego, in the State of California, and from a point at or near Marshall, Texas, as hereinbefore described, and so prosecute the same as to have at least fifty consecutive miles of railroad from each of said points complete and in running order within two years after the passage of this act; and to so continue to construct each year thereafter a sufficient number of miles to secure the completion of the whole line from the aforesaid point on the eastern boundary of the State of Texas to the Bay of San Diego, in the State of California, as aforesaid, within ten years after the passage of this act; and upon failure to so complete it, Congress may adopt such measures as it may deem necessary and proper to secure its speedy completion.

SEC. 18. That the President of the United States, upon the completion of the first section of twenty miles, shall appoint one commissioner, whose duty it shall be to examine the various sections of twenty miles as they shall be completed, and report thereon to him in writing; and if, from such report, he be satisfied that said company has fully completed each section of its road, as in this act provided, he shall direct the Secretary of the Interior to issue patents to said company for the lands it is entitled to under this act, as fast as each section of said road is completed.

SEC. 19. That the Texas Pacific Railroad Company shall be, and it is hereby, declared to be a military and post road; and for the purpose of insuring the carrying of the mails, troops, munitions of war, supplies, and stores of the United States, no act of the company nor any law of any State or Territory shall impede, delay, or prevent the said company from performing its obligations to the United States in that regard: *Provided*, That said road shall be subject to the use of the United States for postal, military, and all other governmental services, at fair and reasonable rates of compensation, not to exceed the price paid by private parties for the same kind of service, and the government shall at all times have the preference in the use of the same for the purpose aforesaid.

Railroad declared to be a military post-road.

Transportation for the United States not to be impeded.

Fair and reasonable rates of compensation.

SEC. 20. That it shall not be lawful for any of the directors, either in their individual capacity or as members of an incorporated or joint-stock company, to make any contracts or agreements with the said Texas Pacific Railroad Company for the construction, equipment, or running of its road, or to have any interest therein; and all such contracts or agreements are hereby declared null and void, and all money or property received under such contracts or agreements may be recovered back for the benefit of the company by any stockholder.

No directors to contract for constructing, &c., any part of the road.

SEC. 21. That any railroad company whose route lies across the route of the Texas Pacific railroad may cross the same, and for the purpose of crossing shall have the right to acquire at the double minimum price all lands, whether of the United States or granted by this act, which shall be needed for a right of way two hundred feet wide through said lands, and for depots, stations, side-tracks, and other needful purposes, not exceeding for such purposes forty acres at any one station.

Railroad companies may cross this road.

May have lands, for right of way and for depots at a certain price.

SEC. 22. That the New Orleans, Baton Rouge, and Vicksburg Railroad Company, chartered by the State of Louisiana, shall have the right to connect by the most eligible route to be selected by said company with the said Texas Pacific railroad at its eastern terminus, and shall have the right of way through the public land to the same extent granted hereby to the said Texas Pacific Railroad Company; and in aid of its construction from New Orleans to Baton Rouge, thence by the way of Alexandria, in said State, to connect with the said Texas Pacific Railroad Company at its eastern terminus, there is hereby granted to said company, its successors and assigns, the same number of alternate sections of public lands per mile, in the State of Louisiana, as are by this act granted in the State of California, to said Texas Pacific Railroad Company; and said lands shall be withdrawn from the market, selected, and patents issued therefor, and opened for settlement and pre-emption, upon the same terms and in the same manner, and time as is provided for and required from said Texas Pacific Railroad Company, within said State of California: *Provided*, That said company shall complete the whole of said road, within five years from the passage of this act.

New Orleans, Baton Rouge and Vicksburg Railroad Company may connect with this road.

Grant of right of way.

Grant of lands to aid its construction.

20 sections per mile in the State of Louisiana.

Lands to be withdrawn from market, &c.

Road to be completed within five years.

SEC. 23. That, for the purpose of connecting the Texas Pacific railroad with the city of San Francisco, the Southern Pacific Railroad Company of California is hereby authorized (subject to the laws of California) to construct a line of railroad from a point at or near Tehachapa Pass, by way of Los Angeles, to the Texas Pacific railroad at or near the Colorado river, with the same rights, grants, and privileges, and subject to the same limitations, restrictions, and conditions as were granted to said Southern Pacific Railroad Company of California, by the act of July twenty-seven, eighteen hundred and sixty-six: *Provided*, however, That this section shall in no way affect or impair the rights, present or prospective, of the Atlantic and Pacific Railroad Company or any other railroad company.

Southern Pacific Railroad Company may construct a road to connect the Texas Pacific Railroad with San Francisco.

Proviso that right of Atlantic and Pacific Railroad Co. shall be in no way impaired.

Approved March 3, 1871.

ACT OF MAY 2, 1872.

CHAP. CXXXII.—An Act supplementary to an Act entitled "An Act to incorporate the Texas Pacific Railroad Company, and to aid in the Construction of its Road, and for other Purposes," approved March third, eighteen hundred and seventy-one.

17 Stat., 59. 1871. ch. 122, vol. xvi, p. 573.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the name, style, and title of the Texas Pacific Railroad Company shall hereafter be "The Texas and Pacific Railway Company;" and the said The Texas and Pacific Railway

Name changed from "Texas Pacific Railroad Co." to "Texas and Pacific Railway Co."

The rights, Company shall have, possess, and enjoy all the rights, privileges, and franchises heretofore conferred upon the said Texas Pacific Railroad Company.

May issue construction and land bonds.

Construction bonds not to exceed \$40,000 per mile. (See sec. 14 of prior act.)

Granted lands may be included in the mortgage to secure said construction bonds.

Land bonds how secured.

No land grant revived, enlarged, extended, or created by this act.

Amount of land bonds not to exceed, &c.

Mortgages to be filed and recorded in the Department of the Interior.

Proceeds of bonds and stock how only to be applied.

Standard of road and equipment to be same as required of the existing Pacific railways.

Prior liens not affected.

The iron or steel rails to be made from American ore, except, &c.

Construction of road to be commenced where, and to be continued in what direction.

100 consecutive miles to be in running order within two years.

100 miles each year thereafter.

Time of completion, 10 years from May 2, 1872.

Uniform gauge.

SEC. 2. That the said The Texas and Pacific Railway Company shall have power and authority to issue the construction and land bonds authorized by the eleventh section of said act of incorporation, for such amounts, not exceeding forty thousand dollars per mile of said road, of construction bonds, as said company may deem needful to provide for the construction and equipment of its line, and to include in the mortgage or mortgages to secure said construction bonds all or any portion of the lands granted in aid of the construction of said railroad; and in the mortgage or mortgages to secure said land bonds, any portion of said lands not so used to secure the construction bonds aforesaid; and all or any portion of the lands acquired by the terms of consolidation lawfully authorized by the fourth section of said act of March third, eighteen hundred and seventy-one, with any railroad company or companies to whom grants of land may have been made, or may hereafter be made, by any congressional, State, or territorial authority, or who may have purchased the same previous to any such arrangement or consolidation, and within the time limited for the completion of the road, and all such lands of every description shall be subject to all limitations and conditions now by law existing in relation thereto, and as modified by this act; and this act shall not be construed to revive, enlarge, extend, or create any land grant whatever, beyond that heretofore granted by Congress, and which shall duly inure to said company upon compliance with the terms of this act in relation to the times fixed for completion of said railway, and all such mortgages shall be subject to all the conditions and limitations by law existing under this act and the acts to which it is supplementary in respect to such lands, and shall not be held to vest any title in the mortgage or create any lien on such lands, other than such company is or may become lawfully entitled to vest or create thereunder; but the amount of said land bonds shall not exceed two and a half dollars per acre for all lands covered by the mortgage or mortgages securing the same.

SEC. 3. That all the mortgages made and executed by said railroad company shall be filed and recorded in the Department of the Interior, which shall be a sufficient evidence of their legal execution: *Provided*, That the aforesaid bonds and the authorized capital stock, or the proceeds thereof, shall be applied only for the purpose of securing the construction, operation, and equipment of the contemplated railroad line, under lawful contracts with such parties, and on such terms and conditions as said company may deem needful, and for the further purpose of purchase, consolidation, completion, equipment, and operating of the other roads, as contemplated by said act and specified therein, being a part of the aforesaid railroad line, and for the expenses necessary and incident to the works authorized thereby: *Provided, however*, That said road and its equipment shall be of the standard heretofore required by the United States government for the existing Pacific railway lines: *And provided further*, That said mortgage or mortgages shall in no wise impair or affect any lien existing on the property of said company or companies at or before the time of such consolidation.

SEC. 4. That said road shall be constructed of iron or steel rails manufactured from American ore, except such as may have been contracted for before consolidation by any railroad company which may be purchased by or consolidated with this company.

SEC. 5. That the said Texas and Pacific Railway Company shall commence the construction of its road at or near Marshall, Texas, and proceed with its construction, under the original act and this supplement, or in pursuance of the authority derived from any consolidation as aforesaid, westerly from a point near Marshall, and towards San Diego, in the State of California, on the line authorized by the original act, and so prosecute the same as to have at least one hundred consecutive miles of railroad from said point complete and in running order within two years after the passage of this act; and so continue to construct, each year thereafter, a sufficient number of miles, not less than one hundred, to secure the completion of the whole line, from the aforesaid point on the eastern boundary of the State of Texas to the Bay of San Diego, in the State of California, as aforesaid, within ten years after the passage of this act; and said road from Marshall, Texas, throughout the length thereof, shall be of uniform gauge: *Provided, however*, That the said

company shall commence the construction of said road from San Diego eastward within one year from the passage of this act, and construct not less than ten miles before the expiration of the second year, and, after the second year, not less than twenty-five miles per annum in continuous line thereafter between San Diego and the Colorado river until the junction is formed with the line from the east at the latter point or east thereof; and upon failure to so complete it, Congress may adopt such measures as it may deem necessary and proper to secure its speedy completion; and it shall also be lawful for said company to commence and prosecute the construction of its line from any other point or points on its line; but nothing in this act contained shall be so construed as to authorize the grant of any additional lands or subsidy, of any nature or kind whatsoever, on the part of the government of the United States: *Provided*, That said Texas and Pacific Railway Company shall be, and it is hereby, authorized and required to construct, maintain, control, and operate a road between Marshall, Texas, and Shreveport, Louisiana, or control and operate any existing road between said points, of the same gauge as the said Texas and Pacific Railroad; and that all roads terminating at Shreveport shall have the right to make the same running connections, and shall be entitled to the same privileges, for the transaction of business in connection with the said Texas and Pacific railway, as are granted to roads intersecting therewith: *Provided further*, That nothing herein shall be construed as changing the terminus of said Texas and Pacific railway from Marshall as provided in the original act.

Road from San Diego eastward, when and how to be built.

Upon failure, Congress may adopt measures necessary to secure speedy completion.

Road between Marshall and Shreveport to be controlled and operated by Texas and Pacific.

Sec. 6. That all acts or parts of acts inconsistent with this supplement be, and the same are hereby, repealed.

Repealing clause.

Approved May 2, 1872.

ACT OF MARCH 3, 1873.

CHAP. CCLVII.—An Act supplemental to an Act entitled "An Act to incorporate the Texas Pacific Railroad Company, and to aid in the Construction of its Road, and for other Purposes," approved March third, eighteen hundred and seventy-one.

17 Stat., 596.
1871, ch. 122, vol. xvi, p. 573.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the face value of all bonds hereafter issued by the Texas and Pacific Railroad [Railway] Company, under the provisions of an act approved March third, eighteen hundred and seventy-one, shall, at the option of the company, be either in gold, or other lawful money of the United States, bearing interest, at like option of the company, either in gold, or other lawful money of the United States; and any mortgage heretofore executed by said company, securing bonds payable in any lawful money of the United States other than gold, and the bonds recited therein, and to secure which, said mortgage was given, are hereby legalized, and said mortgage and bonds shall have the same effect as though they had been authorized by the act to which this is a supplement. *Provided*, That in all other respects the requirements of that law in regard to such mortgage and bonds have been fully complied with.

Face value of bonds hereafter issued by Texas and Pacific Railroad Company may be in gold or other lawful money.

Former mortgages legalized, if other requirements of law have been complied with.

Approved March 3, 1873.

ACT OF JUNE 22, 1874.

CHAP. CCCCVI.—An act supplementary to the act entitled "An act to incorporate the Texas Pacific Railroad Company, and to aid in the construction of its road, and for other purposes."

13 Stat., 197.
1871, ch. 122, vol. xvi, pp. 573, 579.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Texas and Pacific Railway Company is hereby empowered to secure, by one or more mortgages upon the whole or any portion of its line, the construction-bonds heretofore authorized to be issued, and to cancel the mortgage now on record with the Secretary of the Interior so far as the same can be done without prejudice to existing rights, and to substitute therefor the mortgage or mortgages hereby authorized, which substituted mortgages shall expressly reserve all rights which may have been acquired under the existing mortgage: *Provided*, That the aggregate

Texas and Pacific Railway Company authorized to secure construction bonds by new mortgages.

To cancel mortgage on record with Secretary of the Interior.

To substitute mortgages au-

thorized by this act.
 Limit heretofore fixed not to be exceeded.
 What new mortgages shall embrace.
 Consolidated roads, how to be deemed.
 No other or further rights granted.

of the said bonds to be issued under and secured by said mortgage or mortgages shall not exceed the limit heretofore fixed by Congress; and said mortgages for the division east of Fort Worth shall embrace the roads and property of the Southern Pacific Railroad Company and of the Southern Trans-continental Railway Company, heretofore merged in and consolidated with the said Texas and Pacific Railway Company, under the authority and requirements of the laws of the State of Texas; and which roads so merged as aforesaid shall for that and all other purposes be deemed and taken to be a part of the said Texas and Pacific Railway, and shall hereafter be subject to all the provisions and limitations of the act of Congress incorporating said company and of the supplements thereto: *And provided further*, That nothing in this act shall be construed or have the effect to entitle said corporation to any other or further rights to public lands, or in any other respect as against the United States, than such as by law it is now entitled to.

Approved June 22, 1874.

LAWS RELATING TO THE SOUTHERN PACIFIC RAILROAD.

Subject.	Date of approval.	United States Statutes.	
		Vol.	Page.
Connection with Atlantic and Pacific	July 7, 1866	14	292
Connection with Texas and Pacific	Mar. 3, 1871	16	573

14 Stat., 192.

CHAP. CCLXXVIII.—An act granting lands to aid in the construction of a railroad and telegraph line from the States of Missouri and Arkansas to the Pacific coast.

SEC. 18. Relating to this company, will be found on page 169 of this report.

ACT OF MARCH 3, 1871.

16 Stat., 573.

CHAP. CXXII.—An act to incorporate the Texas Pacific Railroad Company, and to aid in the construction of its road, and for other purposes.

SEC. 23. Relating to this company will be found on page 175 of this report.

LAWS RELATING TO THE CALIFORNIA AND OREGON, AND THE OREGON AND CALIFORNIA RAILROADS.

Subject.	Date of approval.	U. S. Statutes.	
		Vol.	Page.
Land grant	July 25, 1866	14	239
Extension of time—eighteen months	June 25, 1868	15	80
Time of acceptance extended to April 10, 1870	Apr. 10, 1869	16	47

ACT OF JULY 25, 1866.

14 Stat., 239.

CHAP. CCKLII.—An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the Central Pacific Railroad, in California, to Portland, in Oregon.

The California and Oregon R. R. Co. of California and an Oregon company empowered to locate and construct a railroad and telegraph line.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the "California and Oregon Railroad Company," organized under an act of the State of California, to protect certain parties in and to a railroad survey, "to connect Portland, in Oregon, with Marysville, in California," approved April sixth, eighteen hundred and sixty-three, and such company organized under the laws of Oregon as the legislature of said State shall hereafter designate, be, and they are hereby, authorized and empowered to lay out,

ocate, construct, finish, and maintain a railroad and telegraph line between the city of Portland, in Oregon, and the Central Pacific Railroad, in California, in the manner following, to wit: The said California and Oregon Railroad Company to construct that part of the said railroad and telegraph within the State of California, beginning at some point (to be selected by said company) on the Central Pacific Railroad in the Sacramento valley, in the State of California, and running thence northerly, through the Sacramento and Shasta valleys, to the northern boundary of the State of California; and the said Oregon company to construct that part of the said railroad and telegraph line within the State of Oregon, beginning at the city of Portland, in Oregon, and running thence southerly through the Willamette, Umpqua, and Rogue River valleys to the southern boundary of Oregon, where the same shall connect with the part aforesaid to be made by the first-named company: *Provided*, That the company completing its respective part of the said railroad and telegraph from either of the termini herein named to the line between California and Oregon before the other company shall have likewise arrived at the same line, shall have the right, and the said company is hereby authorized, to continue in constructing the same beyond the line aforesaid, with the consent of the State in which the unfinished part may lie, upon the terms mentioned in this act, until the said parts shall meet and connect, and the whole line of said railroad and telegraph shall be completed.

SEC. 2. *And be it further enacted*, That there be, and hereby is, granted to the said companies, their successors and assigns, for the purpose of aiding in the construction of said railroad and telegraph line, and to secure the safe and speedy transportation of the mails, troops, munitions of war, and public stores over the line of said railroad, every alternate section of public land, not mineral, designated by odd numbers, to the amount of twenty alternate sections per mile (ten on each side) of said railroad line; and when any of said alternate sections or parts of sections shall be found to have been granted, sold, reserved, occupied by homestead settlers, pre-empted, or otherwise disposed of, other lands, designated as aforesaid, shall be selected by said companies in lieu thereof, under the direction of the Secretary of the Interior, in alternate sections designated by odd numbers as aforesaid, nearest to and not more than ten miles beyond the limits of said first-named alternate sections; and as soon as the said companies, or either of them, shall file in the office of the Secretary of the Interior a map of the survey of said railroad, or any portion thereof, not less than sixty continuous miles from either terminus, the Secretary of the Interior shall withdraw from sale public lands herein granted on each side of said railroad, so far as located and within the limits before specified. The lands herein granted shall be applied to the building of said road within the States, respectively, wherein they are situated. And the sections and parts of sections of land which shall remain in the United States within the limits of the aforesaid grant shall not be sold for less than double the minimum price of public lands when sold: *Provided*, That bona fide and actual settlers under the pre-emption laws of the United States may, after due proof of settlement, improvement, and occupation, as now provided by law, purchase the same at the price fixed for said lands at the date of such settlement, improvement, and occupation: *And provided, also*, That, settlers under the provisions of the homestead act, who comply with the terms and requirements of said act, shall be entitled, within the limits of said grant, to patents for an amount not exceeding eighty acres of the land so reserved by the United States, anything in this act to the contrary notwithstanding.

SEC. 3. *And be it further enacted*, That the right of way through the public lands be, and the same is hereby, granted to said companies for the construction of said railroad and telegraph line; and the right, power, and authority are hereby given to said companies to take from the public lands adjacent to the land of said road, earth, stone, timber, water, and other materials for the construction thereof. Said right of way is granted to said railroad to the extent of one hundred feet in width on each side of said railroad where it may pass over the public lands, including all necessary grounds for stations, buildings, workshops, depots, machine-shops, switches, side-tracks, turn-tables, water stations, or any other structures required in the construction and operating of said road.

Between Portland, Oreg., and the Central Pacific Railroad in California. The California company to construct road to northern boundary of State. The Oregon company to construct the road to the southern boundary of Oregon.

The company first completing its part may continue its road with the consent of State.

Grant of land.

Twenty sections per mile.

If any sections of land have been sold, or are occupied, other lands may be selected in lieu thereof.

Limits, 10 miles beyond grant.

When maps of survey are filed, lands to be withdrawn from sale.

Lands granted to be applied to building road in the States where they lie.

Remaining lands to be sold, for what price.

Settlers under pre-emption laws may purchase, at what price, &c.

Under homestead act may have not over 80 acres.

Grant of right of way.

Materials for construction from adjacent lands.

Right of way, 100 feet on each side of said railroad.

Lands for stations, &c.

The President to appoint 3 commissioners to examine road.

Commissioners to report, under oath, to the President.

Patents to be issued for lands coterminous with completed railroad.

Conditions of grant.

Fair and reasonable rates of compensation.

Railroad to be a public highway and free to the United States.

Property and troops of the United States to be transported at the cost of the companies when so required by the government.

Companies to file assent to this act within 1 year. Road to be completed by July 1, 1875.

Gauge to be same as Central Pacific.

Companies to use and operate road as one continuous line.

No discrimination whatever.

If companies fail to comply with certain conditions, this act to be void, and the lands not conveyed to revert to the United States.

If road and telegraph line are not kept in repair, Congress may, &c.

The companies to be governed by the laws of their respective States.

SEC. 4. *And be it further enacted*, That whenever the said companies, or either of them, shall have twenty or more consecutive miles of any portion of said railroad and telegraph line ready for the service contemplated by this act, the President of the United States shall appoint three commissioners, whose compensation shall be paid by said company, to examine the same, and if it shall appear that twenty consecutive miles of railroad and telegraph shall have been completed and equipped in all respects as required by this act, the said commissioners shall so report under oath to the President of the United States, and thereupon patents shall issue to said companies, or either of them, as the case may be, for the lands hereinbefore granted, to the extent of and coterminous with the completed section of said railroad and telegraph line as aforesaid; and from time to time, whenever twenty or more consecutive miles of the said road and telegraph shall be completed and equipped as aforesaid, patents shall in like manner issue upon the report of the said commissioners, and so on until the entire railroad and telegraph authorized by this act shall have been constructed, and the patents of the lands herein granted shall have been issued.

SEC. 5. *And be it further enacted*, That the grants aforesaid are made upon the condition that the said companies shall keep said railroad and telegraph in repair and use, and shall at all times transport the mails upon said railroad, and transmit despatches by said telegraph line for the government of the United States, when required so to do by any department thereof, and that the government shall at all times have the preference in the use of said railroad and telegraph therefore at fair and reasonable rates of compensation, not to exceed the rates paid by private parties for the same kind of service. And said railroad shall be and remain a public highway for the use of the government of the United States, free of all toll or other charges upon the transportation of the property or troops of the United States; and the same shall be transported over said road at the cost, charge, and expense of the corporations or companies owning or operating the same, when so required by the government of the United States.

SEC. 6. *And be it further enacted*, That the said companies shall file their assent to this act in the Department of the Interior within one year after the passage hereof, and shall complete the first section of twenty miles of said railroad and telegraph within two years, and at least twenty miles in each year thereafter, and the whole on or before the first day of July, one thousand eight hundred and seventy-five; and the said railroad shall be of the same gauge as the "Central Pacific Railroad" of California, and be connected therewith.

SEC. 7. *And be it further enacted*, That the said companies named in this act are hereby required to operate and use the portions or parts of said railroad and telegraph mentioned in section one of this act for all purposes of transportation, travel, and communication, so far as the government and public are concerned, as one connected and continuous line; and in such operation and use to afford and secure to each other equal advantages and facilities as to rates, time, and transportation, without any discrimination whatever, on pain of forfeiting the full amount of damage sustained on account of such discrimination, to be sued for and recovered in any court of the United States, or of any State, of competent jurisdiction.

SEC. 8. *And be it further enacted*, That in case the said companies shall fail to comply with the terms and conditions required, namely, by not filing their assent thereto as provided in section six of this act, or by not completing the same as provided in said section, this act shall be null and void, and all the lands not conveyed by patent to said company or companies, as the case may be, at the date of any such failure, shall revert to the United States. And in case the said railroad and telegraph line shall not be kept in repair and fit for use, after the same shall have been completed, Congress may pass an act to put the same in repair and use, and may direct the income of said railroad and telegraph line to be thereafter devoted to the United States, to repay all expenditures caused by the default and neglect of said companies or either of them, as the case may be, or may fix pecuniary responsibility, not exceeding the value of the lands granted by this act.

SEC. 9. *And be it further enacted*, That the said "California and Oregon Railroad Company" and the said "Oregon Company" shall be governed by the provisions of the general railroad and telegraph laws of their respective States, as to the construction and management of the said

railroad and telegraph line hereinbefore authorized, in all matters not provided for in this act. Wherever the word "company" or "companies" is used in this act it shall be construed to embrace the words "their associates, successors, and assigns," the same as if the words had been inserted, or thereto annexed.

SEC. 10. *And be it further enacted*, That all mineral lands shall be excepted from the operations of this act; but where the same shall consist of timber, so much of the timber thereon as shall be required to construct said road over such mineral land is hereby granted to said companies: *Provided*, That the term "mineral lands" shall not include lands containing coal and iron.

SEC. 11. *And be it further enacted*, That the said companies named in this act shall obtain the consent of the legislatures of their respective States, and be governed by the statutory regulations thereof in all matters pertaining to the right of way, wherever the said road and telegraph line shall not pass over or through the public lands of the United States.

SEC. 12. *And be it further enacted*, That Congress may at any time, having due regard for the rights of said California and Oregon railroad companies, add to, alter, amend, or repeal this act.

Approved July 25, 1866.

The word "company" to include associates, successors, and assigns.

Mineral lands excepted from this grant.

"Mineral" not coal and iron.

Companies to obtain the consent of States, where road and telegraph line do not pass through public lands.

Act may be amended, &c.

ACT OF JUNE 25, 1868.

CHAP. LXXX.—An Act to amend an Act entitled "An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the Central Pacific Railroad, in California, to Portland, in Oregon."

15 Stat., 80.
1866, ch. 242,*
sec. 6, vol. xiv,
p. 241.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of an act entitled "An act granting lands to aid in the construction of a railroad and telegraph line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July twenty-fifth, eighteen hundred and sixty-six, be so amended as to provide that instead of the times now fixed in said section, the first section of twenty miles of said railroad and telegraph shall be completed within eighteen months from the passage of this act, and at least twenty miles in each two years thereafter, and the whole on or before the first day of July, anno Domini eighteen hundred and eighty.

Extension of time for completion of railroad and telegraph.

July 1, 1880.

Approved June 25, 1868.

ACT OF APRIL 10, 1869.

CHAP. XXVII.—An Act to amend an Act entitled "An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July twenty-five, eighteen hundred and sixty-six.

16 Stat., 47.
1866, ch. 242,
vol. xiv, p. 239.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of an act entitled "An act granting lands to aid in the construction of a railroad and telegraph line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July twenty-five, eighteen hundred and sixty-six, be, and the same is hereby, amended so as to allow any railroad company heretofore designated by the legislature of the State of Oregon, in accordance with the first section of said act, to file its assent to such act in the Department of the Interior within one year from the date of the passage of this act; and such filing of its assent, if done within one year from the passage hereof, shall have the same force and effect to all intents and purposes as if such assent had been filed within one year after the passage of said act: *Provided*, That nothing herein shall impair any rights heretofore acquired by any railroad company under said act, nor shall said act or this amendment be construed to entitle more than one company to a grant of land: *And provided further*, That the lands granted by the act aforesaid shall be sold to actual settlers only, in quantities not greater than one-quarter section to one purchaser, and for a price not exceeding two dollars and fifty cents per acre.

Assent of railroad company to act may be filed within one year from date of this act.

Acquired rights not affected.

Not more than one company entitled to a grant of land.

Lands, how and to whom to be sold.

Approved April 10, 1869.

Laws relating to the Oregon Central Railroad.

Subject.	Date of approval.	United States Statutes.	
		Vol.	Page.
Land grant	May 4, 1870	16	94

ACT OF MAY 4, 1870.

16 Stat., 94. CHAP. LXIX.—An act granting lands to aid in the construction of a railroad and telegraph line from Portland to Astoria and McMinville, in the State of Oregon.

Grant of land, &c., to Oregon Central Railroad Company. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That for the purpose of aiding in the construction of a railroad and telegraph line from Portland to Astoria, and from a suitable point of junction near Forest Grove to the Yamhill River, near McMinville, in the State of Oregon, there is hereby granted to the Oregon Central Railroad Company, now engaged in constructing the said road, and to their successors and assigns, the right of way through the public lands of the width of one hundred feet on each side of said road, and the right to take from the adjacent public lands materials for constructing said road, and also the necessary lands for depots, stations, side tracks, and other needful uses in operating the road, not exceeding forty acres at any one place; and, also, each alternate section of the public lands, not mineral, excepting coal or iron lands, designated by odd numbers nearest to said road, to the amount of ten such alternate sections per mile, on each side thereof, not otherwise disposed of or reserved or held by valid pre-emption or homestead right at the time of the passage of this act. And in case the quantity of ten full sections per mile cannot be found on each side of said road, within the said limits of twenty miles, other lands designated as aforesaid shall be selected under the direction of the Secretary of the Interior on either side of any part of said road nearest to and not more than twenty-five miles from the track of said road to make up such deficiency.

Road from Portland to Astoria, and from Forest Grove to the (Yamhill) River, near McMinville.

Right of way 100 feet on each side of road.

Materials from adjacent lands.

Lands for depots, &c., not exceeding 40 acres at any one place.

20 sections of land per mile.

Lands to be selected to make up deficiency.

Limits 25 miles on each side.

Lands on line of road to be surveyed.

When to be separated from public lands.

Remaining lands to be sold at double the minimum price.

Homestead exemption.

Secretary of the Interior to appoint three commissioners to examine road.

Patents for lands to be issued when commissioners report sections of rail-road completed.

The granted lands to be sold only to actual settlers, in what quantities, and at what price.

SEC. 2. *And be it further enacted,* That the Commissioner of the General Land Office shall cause the lands along the line of the said railroad to be surveyed with all convenient speed. And whenever and as often as the said company shall file with the Secretary of the Interior maps of the survey and location of twenty or more miles of said road, the said Secretary shall cause the said granted lands adjacent to and coterminous with such located sections of road to be segregated from the public lands; and thereafter the remaining public lands, subject to sale within the limits of the said grant, shall be disposed of only to actual settlers at double the minimum price for such lands: *And provided also,* That settlers under the provisions of the homestead act who comply with the terms and requirements of said act, shall be entitled, within the said limits of twenty miles, to patents for an amount not exceeding eighty acres each of the said ungranted lands, anything in this act to the contrary notwithstanding.

SEC. 3. *And be it further enacted,* That whenever and as often as the said company shall complete and equip twenty or more consecutive miles of the said railroad and telegraph, the Secretary of the Interior shall cause the same to be examined, at the expense of the company, by three commissioners appointed by him; and if they shall report that such completed section is a first-class railroad and telegraph, properly equipped and ready for use, he shall cause patents to be issued to the company for so much of the said granted lands as shall be adjacent to and coterminous with the said completed [completed] sections.

SEC. 4. *And be it further enacted,* That the said alternate sections of land granted by this act, excepting only such as are necessary for the company to reserve for depots, stations, side tracks, wood yards, standing ground, and other needful uses in operating the road, shall be sold by the company only to actual settlers, in quantities not exceeding one hundred and sixty acres or a quarter section to any one settler, and at prices not exceeding two dollars and fifty cents per acre.

SEC. 5. *And be it further enacted*, That the said company shall, by mortgage or deed of trust to two or more trustees, appropriate and set apart all the net proceeds of the sales of the said granted lands, as a sinking fund, to be kept invested in the bonds of the United States, or other safe and more productive securities, for the purchase from time to time, and the redemption at maturity, of the first mortgage construction bonds of the company, on the road depots, stations, side tracks, and woodyards, not exceeding thirty thousand dollars per mile of road, payable in gold coin not longer than thirty years from date, with interest payable semi-annually in coin not exceeding the [rate] of seven per centum per annum; and no part of the principal or interest of the said fund shall be applied to any other use until all the said bonds shall have been purchased or redeemed and cancelled; and each of the said first mortgage bonds shall bear the certificate of the trustees, setting forth the manner in which the same is secured and its payment provided for. And the district court of the United States, concurrently with the State courts, shall have original jurisdiction, subject to appeal and writ of error, to enforce the provisions of this section.

SEC. 6. *And be it further enacted*, That the said company shall file with the Secretary of the Interior its assent to this act within one year from the time of its passage; and the foregoing grant is upon condition that said company shall complete a section of twenty or more miles of said railroad and telegraph within two years, and the entire railroad and telegraph within six years, from the same date.

Approved May 4, 1870.

Net proceeds of sales of granted lands to be set apart as a sinking fund for the purchase, &c., of certain bonds.

Bonds and interest, how payable.

Sinking fund to be used only for, &c.

Bonds to bear certificate of trustees.

What courts may enforce this provision.

Company to file assent within, &c.

Conditions of this grant.

APPENDIX H.

General laws of the United States affecting railroads.

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TITLE XXXIV.—COLLECTION OF DUTIES UPON IMPORTS.

CHAP. 7.—The bond and warehouse system.

Revised Statutes, p. 577.
 Penalty for opening car, &c., containing bonded goods.

SEC. 2998. Any person maliciously opening, breaking, or entering, by any means whatever, any car, vessel, vehicle, warehouse, or package containing any such merchandise so delivered for transportation, or removing, injuring, breaking, or defacing any lock or seal placed upon such car, vessel, vehicle, warehouse, or package, or aiding, abetting, or encouraging any other person or persons so to remove, break, injure, or deface such locks or seals, or to open, break, or enter such car, vessel, or vehicle, with intent to remove or cause to be removed unlawfully any merchandise therein, or in any manner to injure or defraud the United States; and any person receiving any merchandise unlawfully removed from any such car, vessel, or vehicle, knowing it to have been so unlawfully removed, shall be guilty of felony, and in addition to any penalties heretofore prescribed shall be punishable by imprisonment for not less than six months nor more than two years.

SEC. 3001. The Secretary of the Treasury shall prescribe the form of the bond to be given for the transportation of merchandise from a port in one collection district to a port in another collection district as provided in the preceding section; also the time for such delivery; and for a failure to transport and deliver within the time limited any such bonded merchandise to the collector at the designated port, a duty of double the amount to which such merchandise would be liable shall be collected, which duty shall be secured by such bond, or the merchandise may be seized and forfeited for such failure, and any steam or other vessel, or vehicle transporting such bonded merchandise, the master, owner, or conductor of which shall fail to deliver the same to the collector at the designated port, shall be liable to seizure and forfeiture. (And the Secretary of the Treasury is hereby authorized to remit, in whole or in part, on such conditions, and under such regulations, not inconsistent with law, as he may prescribe, the additional duty secured by the bond given for the transportation of merchandise from a port in one collection district to a port in another collection district prescribed by the preceding section: *Provided*, That it shall be proved to the satisfaction of the Secretary of the Treasury that the failure to transport and deliver the merchandise aforesaid according to the conditions of the bonds occurred without wilful negligence or fraudulent intent on the part of the obligors.)

Revised Statutes, p. 578.
Form of bond.

Double the amount of duty shall be collected for failure to transport within limits of time given.

Secretary of the Treasury may remit the additional duty.

SEC. 3007. Railroad-cars or other vehicles laden with merchandise sealed by a customs officer, passing, under the provisions of the preceding section and the regulations of the Secretary of the Treasury, from one port in the United States to another therein, through foreign contiguous territory, shall be exempt from the payment of any fees for receiving or certifying manifests thereof.

Cars, &c., to be exempt from payment of fees for manifests.

CHAP. 10.—Enforcement of duty-laws and punishment for violations.

SEC. 3063. No railway-car or engine or other vehicle, or team, used by any person or corporation, as common carriers, in the transaction of their business as such common carriers, shall be subject to forfeiture by force of the provisions of this Title unless it shall appear that the owner, superintendent, or agent of the owner in charge thereof at the time of such unlawful importation or transportation thereon or thereby was a consenting party, or privy to such illegal importation or transportation.

Revised Statutes, p. 588.
Privy of owner of engine, car, &c.

TITLE XXXV.—INTERNAL REVENUE.

Revised Statutes, p. 645.

CHAP. 4.—Distilled spirits.

SEC. 3324. Every person who empties or draws off, or causes to be emptied or drawn off, any distilled spirits from a cask or package bearing any mark, brand, or stamp required by law, shall, at the time of emptying such cask or package, efface and obliterate said mark, stamp, or brand. Every such cask or package from which said mark, brand, or stamp is not effaced and obliterated as herein required, shall be forfeited to the United States, and may be seized by any officer of internal revenue wherever found. And every railroad company or other transportation company, or person who receives or transports, or has in possession with intent to transport, or with intent to cause or procure to be transported, any such empty cask or package, or any part thereof, having thereon any brand, mark, or stamp required by law to be placed on any cask or package containing distilled spirits, shall forfeit three hundred dollars for each such cask or package, or any part thereof, so received or transported, or had in possession with the intent aforesaid; and every boat, railroad-car, cart, dray, wagon, or other vehicle, and all horses and other animals used in carrying or transporting the same, shall be forfeited to the United States.

Stamps to be effaced and obliterated on empty casks, &c.

Railroad company transporting empty casks, &c., having stamps on, liable to penalty of \$300.

Vehicles forfeited.

Revised Stat-
utes, p. 690.

TITLE XXXVI.—DEBTS DUE BY OR TO THE UNITED STATES.

Damage to prop-
erty of carriers,
&c., while in mil-
itary service.

SEC. 3483. Every person who sustains damage by the capture or destruction by an enemy, or by the abandonment or destruction by the order of the commanding general, the commanding officer, or quartermaster, of any horse, mule, ox, wagon, cart, sleigh, harness, steamboat or other vessel, railroad-engine or railroad-car, while such property is in the military service, either by impressment or contract; or who sustains damage by the death or abandonment and loss of any horse, mule, or ox, while in the service, in consequence of the failure on the part of the United States to furnish the same with sufficient forage, or whose horse, mule, ox, wagon, cart, boat, sleigh, harness, vessel, railroad-engine, or railroad-car is lost or destroyed by unavoidable accident while such property is in the service, shall be allowed and paid the value thereof at the time when such property was taken into the service, except in cases where the risk to which the property would be exposed was agreed to be incurred by the owner: *Provided*, It appears that such loss, capture, abandonment, destruction, or death was without any fault or negligence on the part of the owner of the property, and while the property was actually employed in the service of the United States.

Value to be al-
lowed and paid.

Provided.

Revised Stat-
utes, p. 691.

SEC. 3488. In executing so much of the preceding sections as provides for payment for steamboats and other vessels, and railroad engines or cars, lost or destroyed while in the military service of the United States, the Third Auditor of the Treasury is authorized, in person, or in such manner as he may deem most compatible with the public interests, to take testimony, and make such investigations as he may deem necessary in adjudicating claims; and for such necessary expenses incurred therein, payment may be made upon proper vouchers, certified and approved by the Third Auditor.

Third Auditor
may take testi-
mony in regard
to property lost
while in military
service.

R. S., p. 724.

TITLE XLI.—APPROPRIATIONS.

SEC. 3689. There are appropriated, out of any moneys in the Treasury not otherwise appropriated, for the purposes hereinafter specified, such sums as may be necessary for the same respectively; and such appropriations shall be deemed permanent annual appropriations.

R. S., p. 725.

BONDS ISSUED TO PACIFIC RAILWAY: For payment of interest on bonds issued by authority of law to Pacific Railway.

R. S., p. 727.

HORSES AND OTHER PROPERTY LOST IN MILITARY SERVICE: To pay for horses, mules, oxen, wagons, carts, sleighs, harness, steamboats, and other vessels, railroad-engines and railroad-cars, killed, lost, captured, destroyed, or abandoned while in the military service under the provisions of Title "DEBTS DUE BY OR TO THE UNITED STATES."

R. S., p. 765.

TITLE XLVI.—THE POSTAL SERVICE.

CHAP. 8.—Contracts for carrying the mail.

R. S., p. 765.
Contracts.

SEC. 3942. The Postmaster-General may enter into contracts for carrying the mail, with railway companies, without advertising for bids therefor.

R. S., p. 768.

CHAP. 9.—Carrying the mail.

R. S., p. 768.

SEC. 3964. The following are established post-roads:

All railroads in operation. All railroads or parts of railroads which are now or hereafter may be in operation.

SEC. 3963. The owner of every stage-coach, railway-car, steamboat, or other vehicle or vessel, which shall, with the knowledge of any owner, in whole or in part, or with the knowledge or connivance of the driver, conductor, master, or other person having charge of the same, convey any person acting or employed as a private express for the conveyance of letters or packets, and actually in possession of the same for the purpose of conveying them, contrary to the spirit, true intent, and meaning of this Title shall, for every such offense, be liable to a penalty of one hundred and fifty dollars.

Rev. Stat., p. 770.
Carrying persons acting as private express for conveyance of letters prohibited.

Penalty for every such offense, \$150.

SEC. 3965. No stage-coach, railway-car, steamboat, or other vehicle or vessel which regularly performs trips at stated periods on any post-route, or from any city, town, or place, to any other city, town, or place, between which the mail is regularly carried, shall carry, otherwise than in the mail, any letters or packets, except such as relate to some part of the cargo of such steamboat or other vessel, or to some article carried at the same time by the same stage-coach, railway-car, or other vehicle, except as provided in section three thousand nine hundred and ninety-three; and for every such offense the owner of the stage-coach, railway-car, steamboat, or other vehicle or vessel shall be liable to a penalty of one hundred dollars; and the driver, conductor, master, or other person having charge thereof, and not at the time owner of the whole or any part thereof, shall for every such offense be liable to a penalty of fifty dollars.

Rev. Stat., p. 770.
Vehicles not to carry letters.

Exception.

Penalty to be paid for every such offense, \$100 by the owner and \$50 by the driver.

CHAP. 10.—Railway service.

Rev. Stat., p. 772.

SEC. 3997. The Postmaster-General shall arrange the railway-routes on which the mail is carried, including those in which the service is partly by railway and partly by steamboat, into three classes, according to the size of the mails, the speed at which they are carried, and the frequency and importance of the service, so that each railway company shall receive, as far as practicable, a proportionate and just rate of compensation, according to the service performed.

Railway-routes to be classified according to size of mails, speed of carriage, and frequency and importance of service.

SEC. 3998. The pay for carrying the mail on any railway of the first class shall not exceed three hundred dollars per mile per annum; on any railway of the second class it shall not exceed one hundred dollars per mile per annum; and on any railway of the third class it shall not exceed fifty dollars per mile per annum; but if one-half the service on any railway is required to be performed in the night-time, the Postmaster-General may pay twenty-five per centum in addition to the above maximum rates.

Rev. Stat., p. 772.
Pay for carrying mail not to exceed, &c.

SEC. 3999. If the Postmaster-General is unable to contract for carrying the mail on any railway-route at a compensation not exceeding the maximum rates herein provided, or for what he may deem a reasonable and fair compensation, he may separate the letter-mail from the other mail, and contract, either with or without advertising, for carrying such letter-mail by horse-express or otherwise, at the greatest speed that can reasonably be obtained, and for carrying the other mail in wagons, or otherwise, at a slower rate of speed.

Rev. Stat., p. 772.
Postmaster-General may contract for carrying letters by horse-express and other mail by wagons, if contract with railroad cannot be made.

SEC. 4000. Every railway company carrying the mail shall carry on any train which may run over its road, and without extra charge therefor, all mailable matter directed to be carried thereon, with the person in charge of the same.

Rev. Stat., p. 773.
Any train shall be used without extra charge.

SEC. 4001. All railway companies to which the United States have furnished aid by grant of lands, right of way, or otherwise, shall carry the mail at such prices as Congress may by law provide; and, until such price is fixed by law, the Postmaster-General may fix the rate of compensation.

Rev. Stat., p. 773.
Aided railway companies shall carry mails at such prices as Congress may by law provide.

If not fixed by law, Postmaster-General may fix price.

SEC. 4002. The Postmaster-General is authorized and directed to re-adjust the compensation hereafter to be paid for the transportation of mails on railroad routes upon the conditions and at the rates hereinafter mentioned:

Rev. Stat., p. 773.
Readjustment of compensation.

First. That the mails shall be conveyed with due frequency and speed; and that sufficient and suitable room, fixtures, and furniture, in a car or apartment properly lighted and warmed, shall be provided for route-agents to accompany and distribute the mails.

Conditions to be complied with.

Rates of pay.

Mail to be weighed not less than 30 successive working days.

Rev. Stat., p. 773.

Refusal to continue to furnish postal cars.

Rev. Stat., p. 773.

Additional pay for postal-cars.

Rev. Stat., p. 773.

Railway postal cars to be properly fitted up, &c.

Second. That the pay per mile per annum shall not exceed the following rates, namely: On routes carrying their whole length an average weight of mails per day of two hundred pounds, fifty dollars; five hundred pounds, seventy-five dollars; one thousand pounds, one hundred dollars; one thousand five hundred pounds, one hundred and twenty-five dollars; two thousand pounds, one hundred and fifty dollars; three thousand five hundred pounds, one hundred and seventy-five dollars; five thousand pounds, two hundred dollars, and twenty-five dollars additional for every additional two thousand pounds, the average weight to be ascertained, in every case, by the actual weighing of the mails for such a number of successive working-days, not less than thirty, at such times, after the thirtieth, eighteen hundred and seventy-three, and not less frequently than once in every four years, and the result to be stated and verified in such form and manner as the Postmaster-General may direct.

SEC. 4003. In case any railroad-company now furnishing railway post-office cars shall refuse to provide such cars, such company shall not be entitled to any increase of compensation under the provisions of the next section.

SEC. 4004. Additional pay may be allowed for every line comprising a daily trip each way of railway post-office cars, at a rate not exceeding twenty-five dollars per mile per annum for cars forty feet in length; and thirty dollars per mile per annum for forty-five-foot cars; and forty dollars per mile per annum for fifty-foot cars; and fifty dollars per mile per annum for fifty-five to sixty-foot cars.

SEC. 4005. The length of cars required for such post-office railway-car service shall be determined by the Post-Office Department, and all such cars shall be properly fitted up, furnished, warmed, and lighted for the accommodation of clerks to accompany and distribute the mails.

Rev. Stat., p. 848.

TITLE L.—REGULATION OF VESSELS IN DOMESTIC COMMERCE.

(Inter-State regulations to prevent cruelty to animals in transit.)

Transportation of animals from one State to another.

Animals not to be confined longer than 28 hours without unloading for rest, water, and feed.

How time is to be estimated.

Animals shall be properly fed and watered.

Lien for food, care, &c.

Neglect to comply with law to be punished.

Penalty \$100 to \$500.

SEC. 4386. No railroad company within the United States whose road forms any part of a line of road over which cattle, sheep, swine, or other animals are conveyed from one State to another, or the owners or masters of steam, sailing, or other vessels carrying or transporting cattle, sheep, swine, or other animals from one State to another, shall confine the same in cars, boats, or vessels of any description, for a longer period than twenty-eight consecutive hours, without unloading the same for rest, water, and feeding, for a period of at least five consecutive hours, unless prevented from so unloading by a storm or other accidental causes. In estimating such confinement the time during which the animals have been confined without such rest on connecting roads from which they are received shall be included, it being the intent of this section to prohibit their continuous confinement beyond the period of twenty-eight hours, except upon contingencies hereinbefore stated.

SEC. 4387. Animals so unloaded shall be properly fed and watered during such rest by the owner or person having the custody thereof, or in case of his default in so doing, then by the railroad company or owners or masters of boats or vessels transporting the same at the expense of the owner or person in custody thereof; and such company, owners, or masters shall in such case have a lien upon such animals for food, care and custody furnished, and shall not be liable for any detention of such animals.

SEC. 4388. Any company, owner, or custodian of such animals who knowingly and willingly fails to comply with the provisions of the two preceding sections, shall, for every such failure, be liable for and forfeit and pay a penalty of not less than one hundred nor more than five hundred dollars. But when animals are carried in cars, boats, or other vessels in which they can and do have proper food, water, space, and opportunity to rest, the provisions in regard to their being unloaded shall not apply.

SEC. 4389. The penalty created by the preceding sections shall be recovered by civil action in the name of the United States, in the circuit or district court of the United States, holden within the district where the violation may have been committed, or the person or corporation resides or carries on its business; and it shall be the duty of all United States marshals, their deputies and subordinates, to prosecute all violations which come to their notice or knowledge.

Penalty recovered by civil action in United States courts.

Duty of U. S. marshals to prosecute.

SEC. 4390. Any person or corporation entitled to a lien under section (forty-four hundred and fifty-three) (forty-three hundred and eighty-seven) may enforce the same by a petition filed in the district court holden within the district where the food, care, and custody have been furnished, or the owner or custodian of the property resides; and the court shall have power to issue all suitable process for the enforcement of such lien by sale or otherwise, and to compel the payment of all costs, penalties, charges, and expenses of proceedings under the provisions of this and the preceding sections.

Lien enforced by petition in U. S. district court.

TITLE LXIV.—RAILWAYS.

Rev. Stat., p. 1017.

SEC. 5252. Every railroad company in the United States, whose road is operated by steam, its successors and assigns, is hereby authorized to carry upon and over its road, boats, bridges, and ferries, all passengers, troops, Government supplies, mails, freight, and property on their way from any State to another State, and to receive compensation therefor, and to connect with roads of other States so as to form continuous lines for the transportation of the same to the place of destination. But this section shall not affect any stipulation between the Government of the United States and any railroad company for transportation or fares without compensation, nor impair or change the conditions imposed by the terms of any act granting lands to any such company to aid in the construction of its road, nor shall it be construed to authorize any railroad company to build any new road or connection with any other road without authority from the State in which such railroad or connection may be proposed. And Congress may at any time alter, amend, or repeal this section.

Inter-State communication by railroad.

Stipulations between the government and any railroad company not affected.

Congress may alter, amend, or repeal.

SEC. 5259. Whenever, in any grant of land or other subsidies, made or hereafter to be made, to railroads or other corporations, the United States has reserved the right, or shall reserve it, to appoint directors, engineers, commissioners, or other agents to examine the roads, or act in conjunction with other officers of such company or companies, all the costs, charges, and pay of such directors, engineers, commissioners, or agents shall be paid by the respective companies. Such directors, engineers, commissioners, or agents shall be paid for such services the sum of ten dollars per day, for each and every day actually and necessarily employed, and ten cents per mile for each and every mile actually and necessarily traveled, in discharging the duties required of them, which per diem and mileage shall be in full compensation for such services. In case any company shall refuse or neglect to make such payments, no more patents for lands or other subsidies shall be issued to such company until these requirements are complied with.

Compensation of directors, engineers, commissioners to be paid by railroad companies.

Ten dollars per day and ten cents per mile.

Refusal to pay followed by non-issue of patents for lands.

AN ACT making appropriations for the service of the Post-Office Department for the fiscal year ending June thirtieth, eighteen hundred and seventy-seven, and for other purposes.

19 Stat., 78.

Provided, That the Postmaster General be, and he is hereby, authorized and directed to readjust the compensation to be paid from and after the first day of July, eighteen hundred and seventy-six, for transportation of mails on railroad-routes by reducing the compensation to all railroad companies for the transportation of mails ten per centum per annum from the rates fixed and allowed by the first section of an act entitled "An act making appropriations for the service of the Post-Office

19 Stat., 79. Compensation to railroads to be readjusted.

Department for the fiscal year ending June thirtieth, eighteen hundred and seventy-four, and for other purposes," approved March third, eighteen hundred and seventy-three, for the transportation of mails on the basis of the average weight.

19 Stat., 82. SEC. 13. That rail-road-companies whose railroad was constructed in whole or in part by a land-grant made by Congress on the condition that the mails should be transported over their road at such price as Congress should by law direct, shall receive only eighty per centum of the compensation authorized by this act.

19 Stat., 102. AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-seven, and for other purposes.

Survey of public lands. 19 Stat., 121. * * * And provided further, That before any land granted to any railroad company by the United States shall be conveyed to such company, or any persons entitled thereto under any of the acts incorporating or relating to said company, unless such company is exempted by law from the payment of such cost, there shall first be paid into the Treasury of the United States the cost of surveying, selecting, and conveying the same by the said company or persons in interest.

20 Stat., 88. AN ACT authorizing the citizens of Colorado, Nevada, and the Territories to fell and remove timber on the public domain for mining and domestic purposes.

Timber on mineral lands may be taken for certain purposes. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all citizens of the United States and other persons, bona fide residents of the State of Colorado, or Nevada, or either of the Territories of New Mexico, Arizona, Utah, Wyoming, Dakota, Idaho, or Montana, and all other mineral districts of the United States, shall be, and are hereby, authorized and permitted to fell and remove, for building, agricultural, mining, or other domestic purposes, any timber or other trees growing or being on the public lands, said lands being mineral, and not subject to entry under the existing laws of the United States, except for mineral entry, in either of said States, Territories, or districts of which such citizens or persons may be at the time bona-fide residents, subject to such rules and regulations as the Secretary of the Interior may prescribe for the protection of the timber and of the undergrowth growing upon such lands, and for other purposes: Provided, The provisions of this act shall not extend to railroad corporations.*

20 Stat., 142. AN ACT making appropriations for the service of the Post-Office Department for the fiscal year ending June thirtieth, eighteen hundred and seventy-nine, and for other purposes.

Postmaster-General directed to readjust and reduce compensation for transportation of mails, 5 per cent. *And provided further, That the Postmaster-General be, and he is hereby, authorized and directed to readjust the compensation to be paid from and after the first day of July, eighteen hundred and seventy-eight, for transportation of mails on railroad routes by reducing the compensation to all railroad companies for the transportation of mails five per centum per annum from the rates for the transportation of mails, on the basis of the average weight fixed and allowed by the first section of an act entitled "An act making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, eighteen hundred and seventy-seven, and for other purposes," approved July twelfth, eighteen hundred and seventy-six.*

AN ACT making appropriations for the service of the Post Office Department for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for other purposes. March 3, 1879. 20 Stat., 358.

SEC. 3. The Postmaster General shall, in all cases, decide upon what trains and in what manner the mails shall be conveyed. The Postmaster-General to decide upon trains and manner of conveying mails.

SEC. 4. That all cars or parts of cars used for the railway mail service shall be of such style, length, and character, and furnished in such manner, as shall be required by the Postmaster General, and shall be constructed, fitted up, maintained, heated, and lighted by and at the expense of the railroad companies. Style, &c., of mail-cars.

SEC. 5. That the Postmaster General shall deduct from the pay of the railroad companies, for every failure to deliver a mail within its schedule time, not less than one-half of the price of the trip, and where the trip is not performed, not less than the price of one trip, and not exceeding, in either case, the price of three trips: *Provided, however,* That if the failure is caused by a connecting road then only the connecting road shall be fined. And where such failure is caused by unavoidable casualty, the Postmaster General, in his discretion, may remit the fine. And he may make deductions and impose fines for other delinquencies. Penalty for failure to deliver mail on schedule time.

SEC. 6. That the Postmaster General shall request all railroad companies transporting the mails to furnish, under seal, such data relating to the operating, receipts and expenditures of such roads as may, in his judgment be deemed necessary to enable him to ascertain the cost of mail transportation and the proper compensation to be paid for the same; and he shall, in his annual report to Congress, make such recommendations, founded on the information obtained under this section, as shall, in his opinion, be just and equitable. *Provido.* Remission of fines. Railroad companies to furnish data relating to the operating, receipts and expenditures.

The Postmaster-General to report to Congress.

AN ACT making appropriations for sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for other purposes. 20 Stat., 390. March 3, 1879.

For the payment of arrears of Army transportation due such land grant railroads as have not received aid in government bonds as compensation was withheld from, under the acts of June sixteenth and twenty second, eighteen hundred and seventy four, and March third, eighteen hundred and seventy five, to be adjusted by the proper accounting officers in accordance with the decision of the Supreme Court in cases decided under the said acts, to be paid as other Army transportation, but in no event shall more than fifty per cent. of the full amount allowed by the Quartermaster-General be paid until the decision of the Court of Claims be had in each case, three hundred thousand dollars or so much thereof as may be necessary. Payment for Army transportation due land grant railroads to be adjusted in accordance with decision of the Supreme Court. Withholding 50 per cent.

APPENDIX I.

Laws of the United States relating to the telegraph.

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ACT OF MARCH 3, 1843.

AN ACT to test the practicability of establishing a system of electro-magnetic telegraphs by the United States.

5 Stat., 618.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of thirty thousand dollars be, and is hereby, appropriated out of any moneys in the treasury not otherwise appropriated, for testing the capacity and usefulness of the system of electro-magnetic telegraphs invented by Samuel F. B. Morse, of New York, for the use of the Government of the United States, by constructing a line of said electro-magnetic telegraphs, under the superintendence of Professor Samuel F. B. Morse, of such length, and between such points, as shall fully test its practicability and utility and that the same shall be expended, under the direction of the Secretary of the Treasury, upon the application of said Morse.

SEC. 2. And be it further enacted, That the Secretary of the Treasury be, and he is hereby, authorized to pay, out of the aforesaid thirty thousand dollars, to the said Samuel F. B. Morse, and the persons employed under him, such sums of money as he may deem to be a fair compensation for the services of the said Samuel F. B. Morse, and the persons employed under him, in constructing and in superintending the construction of the said line of telegraphs authorized by this act.

Approved March 3, 1843.

ACT OF MARCH 3, 1845.

5 Stat., 757. AN ACT making appropriations for the civil and diplomatic expenses of the Government for the year ending the thirtieth June, eighteen hundred and forty-six, and for other purposes.

Magnetic telegraph between Washington and Baltimore. For defraying the expenses of the magnetic telegraph from the city of Washington to Baltimore for the current year, ending on the first day of February next, the said sum to be disbursed under the direction and superintendence of the Postmaster-General, eight thousand dollars.

ACT OF JUNE 19, 1846.

9 Stat., 19. AN ACT making Appropriations for the Service of the Post-Office Department for the Year ending thirtieth June, eighteen hundred and forty-seven.

Magnetic telegraph between Washington and Baltimore. For defraying the expenses of the magnetic telegraph from the city of Washington to Baltimore, four thousand dollars; this appropriation to be available, if need be, before the commencement of the next fiscal year: *Provided*, That the Postmaster-General be, and he is hereby, authorized to let, for a limited time, the aforesaid telegraph to any person who will keep it in operation for its earnings; or he may, under the direction of the President of the United States, sell the same.

ACT OF AUGUST 10, 1846.

9 Stat., 89. AN ACT making Appropriations for the civil and diplomatic Expenses of Government for the Year ending the thirtieth Day of June, eighteen hundred and forty-seven and for other Purposes.

Proceeds of the telegraph betw'n Washington and Baltimore to be placed in the Treasury. For miscellaneous items, eight hundred dollars: *Provided*, That the proceeds of the telegraph between Washington city and Baltimore be, and the same are hereby, directed to be placed in the treasury of the United States for the benefit of the post-office department in the same manner as other revenues from postages.

ACT OF FEBRUARY 17, 1855.

19 Stat., 610. AN ACT authorizing the Construction of a Line of Telegraph from the Mississippi or Missouri Rivers to the Pacific Ocean.

Authority to construct a line of telegraph from the Mississippi or Missouri River to San Francisco. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That Hiram O. Alden and James Eddy, their associates and assigns, are hereby authorized and empowered to construct, at their own expense, a line of telegraph, from such point on the Mississippi or Missouri River as they may hereafter select, through the public lands belonging to the United States, over which lands the right of way two hundred feet in width, for that purpose, is hereby granted to San Francisco, in California, in as direct a line as practicable.

Right of way granted, 200 feet in width.

Injury to telegraph declared trespass, and to be punished.

Jurisdiction in such cases.

SEC. 2. *And be it further enacted*, That all voluntary or intentional injuries to said line of telegraph, or to any property thereto belonging, within the Territories of the United States, shall be deemed, and are hereby declared to be wilful and malicious trespasses, and shall be punished as such; and all laws of the United States now in force in any territory thereof, or which may hereafter be enacted for the better security and protection of property, and applicable to such offences, shall be, and they are hereby, extended, for the protection of said line of telegraph, into and over all the territory belonging to, and under the jurisdiction of, the United States, through which the same may be constructed; and all legal process and proceedings for the detection and punishment of the aforesaid offences shall be within the jurisdiction of the courts, and shall be issued and executed by the proper law officers in the States or organized territories.

Approved February 17, 1855.

ACT OF MARCH 3, 1857.

AN ACT to expedite Telegraphic Communication for the Uses of the Government in its Foreign Intercourse. 11 Stat., 187.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of State, in the discretion, and under the direction of the President of the United States, may contract with any competent person, persons, or association, for the aid of the United States, by furnishing not exceeding two ships in laying down a submarine cable, to connect existing telegraphs between the coast of Newfoundland and the coast of Ireland, and for the use of such submarine communication when established by the government of the United States, on such terms and conditions as shall seem to the President just and reasonable, not exceeding seventy thousand dollars per annum until the net profits of such person, or persons, or association shall be equal to a dividend of six per cent. per annum, and then not exceeding fifty thousand dollars per annum for twenty-five years: *Provided*, That the government of Great Britain shall, before or at the same time, enter into a like contract for those purposes with the same person, persons, or association, and upon terms of exact equality with those stipulated by the United States: *And provided*, That the tariff of prices for the use of such submarine communication by the public shall be fixed by the Secretary of the Treasury of the United States and the government of Great Britain, or its authorized agent: *Provided further*, That the United States and the citizens thereof shall enjoy the use of the said submarine telegraph communication for all time on the same terms and conditions which shall be stipulated in favor of the government of Great Britain, and the subjects thereof, recognizing equality of rights among the citizens of the United States in the use of said submarine communication and the lines of telegraph which may at any time connect with the same at its terminus on the coast of Newfoundland and in the United States, in any contract so to be entered into by such person, persons, or association, with that government: *Provided further*, That the contract to be made by the British government shall not be different from that already proposed by that government to the New York, Newfoundland, and London Telegraph Company, except such provisions as may be necessary to secure to each government the transmission of its own messages by its own agents: *And provided further*, That it shall be in the power of Congress, after ten years, to terminate said contract upon giving one year's notice to the parties to such contract.

The Secretary of State, by direction of the President, may contract to furnish 2 ships to aid in laying submarine telegraph in the Atlantic Ocean.

Appropriation for use of submarine telegraph.

Great Britain to enter into a like contract.

Tariff of prices to be fixed by the Secretary of the Treasury.

United States and Great Britain to have equal rights.

Contract to terminate after ten years upon one year's notice.

Approved March 3, 1857.

ACT OF JUNE 16, 1860.

AN ACT to facilitate Communication between the Atlantic and Pacific States by Electric Telegraph. 12 Stat., p. 41.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury, under the direction of the President of the United States, is hereby authorized and directed to advertise for sealed proposals, to be received for sixty days after the passage of this act, (and the fulfilment of which shall be guaranteed by responsible parties, as in the case of bids for mail contracts,) for the use by the government of a line or lines of magnetic telegraph, to be constructed within two years from the thirty-first day of July, eighteen hundred and sixty, from some point or points on the west line of the State of Missouri, by any route or routes which the said contractors may select, (connecting at such point or points by telegraph with the cities of Washington, New Orleans, New York, Charleston, Philadelphia, Boston, and other cities in the Atlantic, Southern, and Western States,) to the city of San Francisco, in the State of California, for a period of ten years, and shall award the contract to the lowest responsible bidder or bidders, provided such proffer does not require a larger amount per year from the United States than forty thousand dollars; and permission is hereby granted to the said parties to whom said contract may be awarded, or a majority of them, and their assigns, to use until the end of the said term, such unoccupied public lands of the United States as may be necessary for the right of way and

Proposals for use of telegraph to be advertised for by the Secretary of the Treasury.

Telegraph to be constructed from Missouri to San Francisco.

Contract to be awarded to the lowest responsible bidder.

Public lands for

right of way and stations may be used to the end of the term.

No contract to be made until line is in actual operation.

Government entitled to priority in use.

Lines shall be open to the use of all citizens of the United States.

Charges not to exceed \$3 for a dispatch of ten words.

Similar privileges may be conferred upon other parties.

A branch line to Oregon authorized to be constructed.

Use of permanent right of way and station lands given during the term.

If annual government business at ordinary rates exceed the contract price, amount of excess shall be certified to Congress.

Use of line to be for scientific purposes.

Messages shall be impartially transmitted.

Right to alter or amend reserved by Congress.

for the purpose of establishing stations for repairs along said line, not exceeding at any station one quarter-section of land, such stations not to exceed one in fifteen miles on an average of the whole distance, unless said lands shall be required by the government of the United States for railroad or other purposes, and provided that no right to preëmpt any of said lands under the laws of the United States shall inure to said company, their agents or servants, or to any other person or persons whatsoever: *Provided*, That no such contract shall be made until the said line shall be in actual operation, and payments thereunder shall cease whenever the contractors fail to comply with their contract; that the government shall at all times be entitled to priority in the use of the line or lines, and shall have the privilege, when authorized by law, of connecting said line or lines by telegraph with any military posts of the United States, and to use the same for government purposes: *And provided, also*, That said line or lines, except such as may be constructed by the government to connect said line or lines with the military posts of the United States, shall be open to the use of all citizens of the United States during the term of the said contract, on payment of the regular charges for transmission of dispatches: *And provided, also*, That such charges shall not exceed three dollars for a single dispatch of ten words, with the usual proportionate deductions upon dispatches of greater length, provided that nothing herein contained shall confer upon the said parties any exclusive right to construct a telegraph to the Pacific, or debar the government of the United States from granting, from time to time, similar franchises and privileges to other parties.

SEC. 2. *And be it further enacted*, That the said contractors, or their assigns, shall have the right to construct and maintain, through any of the territories of the United States, a branch line, so as to connect their said line or lines with Oregon; and that they shall have the permanent right of way for said line or lines, under, or over, any unappropriated public lands and waters in the said territories, by any route or routes which the said contractors may select, with the free use during the said term of such lands as may be necessary for the purpose of establishing stations for repairs along said line or lines, not exceeding, at any station, one quarter-section of land, such stations not to exceed one in fifteen miles on an average of the whole distance; but should any of said quarter-sections be deemed essential by the government, or any company acting under its authority, for railroad purposes, the said contractors shall relinquish the occupancy of so much as may be necessary for the railroad, receiving an equal amount of land for like use in its stead.

SEC. 3. *And be it further enacted*, That if, in any year during the continuance of said contract, the business done for the government, as hereinbefore mentioned, by such contractors or their assigns, shall, at the ordinary rate of charges for private messages, exceed the price contracted to be paid as aforesaid, the Secretary of the Treasury shall, upon said accounts being duly authenticated, certify the amount of such excess to Congress: *Provided*, That the use of the line be given, at any time, free of cost, to the Coast Survey, the Smithsonian Institution, and the National Observatory, for scientific purposes: *And provided further*, That messages received from any individual, company, or corporation, or from any telegraph lines connecting with this line at either of its termini, shall be impartially transmitted in the order of their reception, excepting that the dispatches of the government shall have priority: *And provided further*, That Congress shall at any time have the right to alter or amend this act.

Approved June 16, 1860.

ACT OF JANUARY 31, 1862.

12 Stat., 334. AN ACT to authorize the President of the United States in certain Cases to take Possession of Railroad and Telegraph Lines, and for other Purposes.

Telegraph lines may be taken possession of by the President.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States, when in his judgment the public safety may require it, be, and he is hereby authorized to take possession of any or all the telegraph lines in the United States, their offices and appurtenances; to take possession

of any or all the railroad lines in the United States, their rolling-stock, their offices, shops, buildings, and all their appendages and appurtenances; to prescribe rules and regulations for the holding, using, and maintaining of the aforesaid telegraph and railroad lines, and to extend, repair, and complete the same, in the manner most conducive to the safety and interest of the government; to place under military control all the officers, agents, and employes belonging to the telegraph and railroad lines thus taken possession of by the President, so that they shall be considered as a post-road and a part of the military establishment of the United States, subject to all the restrictions imposed by the rules and articles of war.

Also, railroad lines, &c.

The President to prescribe rules for use of telegraphs and railroads.

Under military control.

SEC. 2. *And be it further enacted*, That any attempt by any party or parties whomsoever, in any State or District in which the laws of the United States are opposed, or the execution thereof obstructed by insurgents and rebels against the United States, too powerful to be suppressed by the ordinary course of judicial proceedings, to resist or interfere with the unrestrained use by Government of the property described in the preceding section, or any attempt to injure or destroy the property aforesaid, shall be punished as a military offence, by death, or such other penalty as a court-martial may impose.

Any attempt to resist use or to injure property to be punished by death or otherwise.

SEC. 3. *And be it further enacted*, That three commissioners shall be appointed by the President of the United States, by and with the advice and consent of the Senate, to assess and determine the damages suffered, or the compensation to which any railroad or telegraph company may be entitled by reason of the railroad or telegraph line being seized and used under the authority conferred by this act, and their award shall be submitted to Congress for their action.

President to appoint three commissioners to determine damages or compensation.

SEC. 4. *And be it further enacted*, That the transportation of troops, munitions of war, equipments, military property and stores, throughout the United States, shall be under the immediate control and supervision of the Secretary of War and such agents as he may appoint; and all rules, regulations, articles, usages, and laws in conflict with this provision are hereby annulled.

Transportation of troops and supplies under the control of Secretary of War.

SEC. 5. *And be it further enacted*, That the compensation of each of the commissioners aforesaid shall be eight dollars per day while in actual service; and that the provisions of this act, so far as it relates to the operating and using said railroads and telegraphs, shall not be in force any longer than is necessary for the suppression of this rebellion.

Pay of commissioners to be \$8 per day.

Approved January 31, 1862.

ACT OF JULY 1, 1862.

AN ACT to provide Internal Revenue to support the Government and to pay Interest on the Public Debt. 12 Stat., 478.

SEC. 104. *And be it further enacted*, That on and after the date on which this act shall take effect, no telegraph company or its agent or employee, shall receive from any person, or transmit to any person, any despatch or message without an adhesive stamp denoting the duty imposed by this act being affixed to a copy thereof, or having the same stamped thereupon, and in default thereof shall incur a penalty of ten dollars: *Provided*, That only one stamp shall be required, whether sent through one or more companies.

No telegraph company to send messages without being stamped.



ACT OF JULY 1, 1862.

AN ACT to aid in the Construction of a Railroad and Telegraph Line from the Missouri River to the Pacific Ocean, and to secure to the Government the Use of the same for Postal, Military, and Other Purposes. 12 Stat., 499, 493, and 497.

(See act printed in full in report of Auditor of Railroad Accounts for 1879, page 107.)

SEC. 6. *And be it further enacted*, That the grants aforesaid are made upon condition that said company shall pay said bonds at maturity, and shall keep said railroad and telegraph line in repair and use, and shall at all times transmit despatches over said telegraph line, and transport

To keep road and telegraph in repair, and to transmit despatches.

Government to have preference in use. mails, troops, and munitions of war, supplies, and public stores upon said railroad for the government, whenever required to do so by any department thereof, and that the government shall at all times have the preference in the use of the same for all the purposes aforesaid, (at fair and reasonable rates of compensation, not to exceed the amounts paid by private parties for the same kind of service;) and all compensation for services rendered for the government shall be applied to the payment of said bonds and interest until the whole amount is fully paid.

Authorized to enter into arrangements with certain telegraph companies.

In case of disagreement the telegraph companies may move their lines.

SEC. 19. *And be it further enacted*, That the several railroad companies herein named are authorized to enter into an arrangement with the Pacific Telegraph Company, the Overland Telegraph Company, and the California State Telegraph Company, so that the present line of telegraph between the Missouri River and San Francisco may be moved upon or along the line of said railroad and branches as fast as said roads and branches are built; and if said arrangement be entered into, and the transfer of said telegraph line be made in accordance therewith to the line of said railroad and branches, such transfer shall, for all purposes of this act, be held and considered a fulfilment on the part of said railroad companies of the provisions of this act in regard to the construction of said line of telegraph. And, in case of disagreement, said telegraph companies are authorized to remove their line of telegraph along and upon the line of railroad herein contemplated without prejudice to the rights of said railroad companies named herein.

ACT OF JULY 5, 1862.

12 Stat., 507.

AN ACT making Appropriations for the Support of the Army for the Year ending the thirtieth of June, eighteen hundred and sixty-three, and additional Appropriations for the Year ending the thirtieth of June, eighteen hundred and sixty-two, and for other Purposes.

Construction and expenses of telegraph for military purposes.

For constructing and extending the telegraph for military purposes, and for expenses in operating the same, five hundred thousand dollars.

ACT OF JULY 11, 1862.

12 Stat., 533 and 534.

AN ACT making further Appropriations for sundry Civil Expenses of the Government for the Year ending thirtieth June, eighteen hundred and sixty-three, and additional Appropriations for the year ending thirtieth June, eighteen hundred and sixty-two.

To pay the amount provided for under and by virtue of an act entitled "An act to facilitate communication between the Atlantic and Pacific States by electric telegraph," or so much thereof as may become payable under said act, forty thousand dollars.

To pay overland telegraph.

To pay the amount due under and by virtue of the act entitled "An act to facilitate communication between the Atlantic and Pacific States by electric telegraph," for the period embraced between November one, eighteen hundred and sixty-one, and June thirty, eighteen hundred and sixty-two, twenty-six thousand six hundred and thirty dollars and forty-four cents.

ACT OF FEBRUARY 9, 1863.

12 Stat., 644.

AN ACT making Appropriations for the Support of the Army for the Year ending the thirtieth of June, eighteen hundred and sixty-four, and for a Deficiency for the Signal Service for the Year ending June thirty, eighteen hundred and sixty-three.

For constructing and operating military telegraph.

For telegraph for military purposes, and for expenses in operating the same, five hundred thousand dollars.

ACT OF MARCH 3, 1863.

AN ACT for a Grant of Land to the State of Kansas, in alternate Sections, to aid in the Construction of certain Railroads and Telegraphs in said State. 12 Stat., 772 and 773.

SEC. 4. * * * And when the governor of said state shall so certify, and the Secretary of the Interior shall be satisfied, that the whole of said roads and branches and telegraph are completed in a good, substantial, and workmanlike manner, as first-class railroads and telegraph, the said State may cause to be sold all the remaining lands granted and selected for the purposes indicated in this act situated within the said limits of twenty miles from the line thereof throughout the entire length of said road and branches: * * *

Telegraph required to be built in Kansas.

RESOLUTION OF MARCH 3, 1863.

JOINT RESOLUTION in Relation to Telegraph Companies in the District of Columbia. 12 Stat., 827.

(Be it resolved) by the Senate and House of Representatives of the United States of America in Congress assembled, That the Independent line of Telegraph, a corporation organized under the laws of the State of New York, for the purpose, and with the intention of constructing a line of telegraph from Portland, Maine, to Washington city, or any other corporation or company organized according to law, to construct a line of telegraph, be permitted to use any of the highways, roads, streets, or grounds in the District of Columbia in the extension and operation of their line to, in, and through the city of Washington, and other parts of the District: *Provided, however,* That the location and construction of any such line of telegraph within the said District shall not be carried into effect without the written approval of the Secretary of the Interior and Commissioner of Public Buildings and Grounds first obtained as to the proper route and course of said line to be followed within the said District of Columbia: *And provided, further,* That the use of said highways, streets, roads, and grounds hereby granted for telegraphic purposes shall not obstruct the use and convenient occupancy of said highways, streets, roads, and grounds for public or other purposes, as the same are at present used. And all acts heretofore passed and now in force in the District of Columbia for the protection of telegraph-poles, wires, and corporations, shall be extended to any such line of telegraph.

Permission to telegraph companies to use streets in District of Columbia.

Written approval of Secretary of the Interior, &c., to be obtained before locating and constructing Streets, &c., not to be obstructed.

Approved March 3, 1863.

ACT OF MARCH 14, 1864.

AN ACT to supply Deficiencies in the Appropriations for the Service of the Fiscal Year ending the thirtieth of June, eighteen hundred and sixty-four, and for other Purposes. 13 Stat., 24.

For supplying deficiency in the appropriation for facilitating communication between the Atlantic and Pacific States by electrical telegraph, twenty thousand dollars.

Electrical telegraph between Atlantic and Pacific States.

ACT OF JUNE 15, 1864.

AN ACT making Appropriations for the Support of the Army for the Year ending the thirtieth June, eighteen hundred and sixty-five, and for other Purposes. 13 Stat., 128.

For constructing and extending the telegraph, for military purposes, and for expenses in operating the same, two hundred and seventy-five thousand dollars.

Construction and expenses of military telegraph.

ACT OF JUNE 30, 1864.

13 Stat., 276. AN ACT to provide Internal Revenue to support the Government, to Pay Interest on the Public Debt, and for other Purposes.

SEC. 107. *And be it further enacted*, That any person, firm, company, or corporation owning or possessing or having the care or management of any telegraphic line by which telegraphic despatches or messages are received or transmitted, shall be subject to, and pay a duty of, five per centum on the gross amount of all receipts of such person, firm, company, or corporation.

ACT OF JULY 1, 1864.

13 Stat., 339. AN ACT making an additional Grant of Lands to the State of Kansas to aid in the Construction of Railroad and Telegraph Lines.

Grant to aid a railroad and telegraph from Emporia to Fort Riley, Kansas. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That there be, and hereby is, granted to the State of Kansas, to aid in the construction of a railroad and telegraph line from Emporia, via Council Grove, to a point near Fort Riley, on the Branch Union Pacific Railroad, in said state, every alternate section of land designated by odd numbers for ten sections in

width on each side of said road: *Provided*, That this grant shall be subject to all the provisions, restrictions, limitations, and conditions, in regard to selection and location of lands and otherwise, of an act of congress approved March three, eighteen hundred and sixty-three, entitled "An act for a grant of lands to the State of Kansas, in alternate sections, to aid in the construction of certain railroads and telegraphs in said State:" *Provided*, That said railroad shall be a public highway

1863, ch. 93, vol. xii, p. 772.

A public highway.

Troops, &c. to be transported free of charge.

Route of railroad and telegraph changed.

SEC 2. *And be it further enacted*, That the branch railroad and telegraph from "Lawrence, by the valley of the Wakarusa River, to a point on the Atchison, Topeka, and Santa Fe railroad, where said road intersects the Neosho River," to aid in the construction of which a grant of lands was made by the said act of third of March, eighteen hundred and sixty-three, shall be so changed as to run from Lawrence to Emporia, and have and receive the grant of land made by said act: *Provided*, That the line of railroad and telegraph from Leavenworth, by way of Lawrence and the Ohio City crossing of the Osage River, to the southern line of the state in the direction of Galveston Bay shall run via Baldwin City.

Approved July 1, 1864.

ACT OF JULY 1, 1864.

13 Stat., 340. AN ACT to encourage and facilitate Telegraphic Communication between the Eastern and Western Continents.

WHEREAS, the governments of Russia and Great Britain have granted to Perry McDonough Collins, a citizen of the United States, the right to construct and maintain a line of electric telegraph through their respective territories, from the mouth of the Amoor River, in Asiatic Russia, by way of Behring's strait and along the Pacific coast to the northern boundary of the United States, with a view of thereby uniting the telegraphic systems of both continents, and of promoting international and commercial intercourse; and whereas, the government of Russia, in furtherance of that object, is now constructing a line of telegraph through its Asiatic territory to unite at the mouth of the Amoor River with the line projected by said Collins; and whereas the government of the United States desires cordially to co-operate with Russia and Great Britain in the establishment and maintenance of such a line of communication, now, therefore—

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Perry McDonough Collins, of California, his associates and assignees, shall have the right to construct and maintain a line or lines of telegraph from any point or points on the line of the Pacific telegraph, constructed in pursuance of the act of congress, approved June sixteenth, eighteen hundred and sixty, northerly, through any of the territories of the United States, to the boundaries of British America, with such branch lines as may be needed to open communication with the various mining districts and other settlements in said territories. And for the purposes aforesaid, the said Collins, his associates and assignees, shall have a permanent right of way over any unappropriated public lands of the United States, together with the right to take any timber and stone for construction purposes; and for the purpose of establishing and maintaining said lines and the stations necessary for the repair and working thereof, there is hereby granted to said parties the use of so much unappropriated public lands not sold, granted, reserved, preempted, nor occupied by homestead settlers, as may be necessary for stations, not exceeding forty acres for each fifteen miles of line constructed across the public lands of the United States, so long as the same may be used for said purpose: *Provided, however,* That so much of section one of this act as authorizes the construction of telegraph lines to open communications with the various mining districts and other settlements in said territories, shall be null and void, unless said branch-lines shall be completed within five years from the approval hereof.

Right given to construct lines of telegraph to boundaries of British America.

Permanent right of way over unappropriated public lands.

Lands for stations.

SEC. 2. *And be it further enacted,* That in order to encourage and aid the construction of said line of telegraph beyond the limits of the United States, the Secretary of the Navy is authorized to detail for the use of the surveys and soundings along that portion of the Pacific coast both of America and Asia, where it is proposed to establish said telegraph, one steam or sailing vessel, in his discretion, to assist in surveys and soundings, laying down submerged cable, and in transporting materials connected therewith, and generally afford such assistance as may be deemed best calculated to secure a successful promotion of the enterprise.

Secretary of Navy authorized to detail 1 steam or sailing vessel to aid in laying telegraph, &c.

SEC. 3. *And be it further enacted,* That the government of the United States shall, at all times, have priority in the use of the line or lines, so far as the same are within its territory, and shall have the right, when authorized by law, to connect said line or lines by telegraph with any military posts of the United States, and to use the same for government purposes. And in order to secure the same from injury by savages or other evil-disposed persons, to the interruption of the public business, the Secretary of War is authorized to direct the commanders of the military districts or stations, and other officers, acting under authority of the United States in the territories traversed by said telegraph, to use any available force at their command to protect the same. Subject to the right of prior use by the government, as aforesaid, said line or lines shall be at all times open to the public and to any other telegraph company upon the payment of the regular charges for transmission of despatches, and all despatches received shall be transmitted over said line and lines in the order of their reception at the telegraphic office; and the answers to said despatches shall be delivered to such parties as may be directed by the sender.

United States to have priority in use of the lines of telegraph.

Military to protect.

No discrimination in transmission of despatches.

SEC. 4. *And be it further enacted,* That the better to accomplish the object of this act, namely, to promote the public interest and welfare, by facilitating international and commercial intercourse between the eastern and western continents in the construction of said telegraph, and keeping the same in working order, and to secure to the government at all times, but particularly in time of war, the use and benefits of the same for diplomatic, naval, military, postal, commercial, and other purposes, congress may, at any time, add to, alter, amend, or repeal this act.

To promote the public welfare Congress may alter, amend, or repeal.

SEC. 5. *And be it further enacted,* That the rate of charges for public or private messages shall not exceed on said line the average usual rates in Europe and America for the same service, or such rates as shall be ascertained and fixed by a convention between the United States, Russia, and Great Britain: *Provided,* That it shall not be lawful for the owners or officers of said telegraph line to make any contract, either directly or through any intervening party or parties, for the transmission of despatches for any newspaper or newspaper association, upon

Rates not to exceed the average usual rates in Europe and America.

All newspapers and newspaper associations to have same terms.

terms different from those open to the enjoyment of all other newspapers or newspaper associations.

Approved July 1 1864.

ACT OF JULY 2, 1864.

- 13 Stat., 362. AN ACT to amend an Act entitled "An Act to aid in the Construction of a Railroad and Telegraph line from the Missouri River to the Pacific Ocean, and to secure to the Government the Use of the same for Postal, Military, and other Purposes," approved July first, eighteen hundred and sixty-two.

(See act printed in full in report of Auditor for 1879. Page 115.)

SEC. 15. *And be it further enacted*, That the several companies authorized to construct the aforesaid roads are hereby required to operate and use said roads and telegraph for all purposes of communication, travel, and transportation, so far as the public and the government are concerned, as one continuous line; and, in such operation and use, to afford and secure to each equal advantages and facilities as to rates, time, and transportation, without any discrimination of any kind in favor of the road or business of any or either of said companies, or adverse to the road or business of any or either of the others, and it shall not be lawful for the proprietors of any line of telegraph, authorized by this act, or the act amended by this act to refuse, or fail to convey for all persons requiring the transmission of news and messages of like character, on pain of forfeiting to the person injured for each offence, the sum of one hundred dollars, and such other damage as he may have suffered on account of said refusal or failure, to be sued for and recovered in any court of the United States, or of any state or territory of competent jurisdiction.

ACT OF JULY 2, 1864.

- 13 Stat., 365. AN ACT granting Lands to aid in the Construction of a Railroad and Telegraph Line from Lake Superior to Puget's Sound, on the Pacific Coast, by the northern Route.

(See act printed in full in Appendix of this report.)

SEC. 5. And there shall be constructed a telegraph line, of the most substantial and approved description, to be operated along the entire line: *Provided*, That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service.

ACT OF JULY 2, 1864.

- 13 Stat., 373. AN ACT for increased Facilities of Telegraph Communication between the Atlantic and Pacific States and the Territory of Idaho.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the United States Telegraph Company, and their associates, are hereby authorized to erect a line or lines of magnetic telegraph between the Missouri River and the city of San Francisco, in the State of California, on such route as they may select, to connect with the lines of the said United States Telegraph Company, now constructed, and being constructed through the States of the Union. The said company shall have the use of such unoccupied land of the United States as may be necessary for the right of way, and materials, and for the establishing of stations along said line for repairs, not exceeding at any station one quarter section of land; and such stations not to exceed one in fifteen miles on the average of the whole line, unless said lands shall be required by the government of the United States for railroad or other purposes: *And provided*, That no right to preëmpt any of said lands under the laws of the United States shall enure to said company or their agents, or any other person or persons whatsoever.

Authority given on the United States Telegraph Company to erect lines of magnetic telegraph between the Missouri River and San Francisco. Unoccupied land given for right of way. Station lands.

Authorized to erect a line of telegraph from Fort Hall, to Portland, Oreg. SEC. 2. *And be it further enacted*, That the said United States Telegraph Company, under the direction of the President of the United States, is hereby authorized to erect a line of telegraph from Fort Hall, to Portland, Oreg.

by Walla Walla and the Dalles and San Francisco to Portland, in the State of Oregon, and from Fort Hall to Bannock and Virginia City, in the Territory of Idaho, with the same privileges as to the right of way, and so forth, as is provided in the first section of this act; the United States to have priority in the use of said lines of telegraph to Oregon and Idaho.

From Fort Hall to Virginia City, Idaho.

SEC. 3. *And be it further enacted*, That the aforesaid company is authorized by this act to send and receive dispatches on payment of the regular charges for transmission of dispatches over any line that may now or hereafter be constructed by the authority or aid of congress, to connect with any line or lines authorized or erected by the Russian or English governments, and that all dispatches received by said line or lines shall be transmitted in the order of their reception, and the answers thereto shall be delivered to said United States Telegraph Company for transmission over their lines to the office whence the original message was sent, whenever so directed by the sender thereof.

Authorized to send and receive dispatches over connecting lines.

All dispatches to be transmitted in the order of their reception.

SEC. 4. *And be it further enacted*, That the several railroad companies authorized by act of congress July one, eighteen hundred and sixty-two, are authorized to enter into arrangements with the United States Telegraph Company so that the line of telegraph between the Missouri River and San Francisco may be made upon and along the line of said railroad and branches as fast as said roads and branches are built, and if said arrangements be entered into and the transfer of said telegraph line be made in accordance therewith to the line of said railroads and branches, such transfer shall, for all purposes of the act referred to, be held and considered a fulfillment on the part of said railroad companies of the provision of the act in regard to the construction of a telegraph line; and, in case of disagreement, said telegraph company are authorized to remove their line of telegraph along and upon the line of railroad therein contemplated, without prejudice to the rights of said railroad companies.

The Pacific railroad companies may make arrangements with this telegraph company.

Approved July 2, 1864.

ACT OF MARCH 3, 1865.

AN ACT making Appropriations for the Support of the Army for the Year ending thirtieth June, eighteen hundred and sixty-six. 13 Stat., 496.

For constructing and extending the telegraph for military purposes, and for expenses in operating the same, five hundred thousand dollars. Construction and expenses of military telegraph.

TREATY between the United States of America and the Shoshonee-Goship Bands of Indians, concluded at Tuilla Valley, October 12, 1863. 13 Stat., 681.

ARTICLE III. The telegraph and overland stage lines having been established and operated by companies under the authority of the United States through the country occupied by said bands, it is expressly agreed that the same may be continued without hindrance, molestation, or injury from the people of said bands, and that their property, and the lives and property of passengers in the stages, and of the employees of the respective companies, shall be protected by them.

Telegraph and overland stage lines to be protected by the Shoshonee-Goship bands of Indians.

ACT OF APRIL 7, 1866.

AN ACT making additional Appropriations, and to supply the Deficiencies in the Appropriations for sundry civil Expenses of the Government for the fiscal Year ending the thirtieth of June, eighteen hundred and sixty-six, and for other Purposes.

For facilitating communication between the Atlantic and Pacific States by electrical telegraph, forty thousand dollars.

For facilitating communication between Atlantic and Pacific States.

ACT OF MAY 5, 1866.

- 14 Stat., 44. AN ACT to encourage Telegraphic Communication between the United States and the island of Cuba and other West India Islands and the Bahamas.

Whereas James A. Scrymser, Alfred Pell, junior, Alexander Hamilton, junior, Oliver K. King, Maturin L. Delafield, William F. Smith, and James M. Digges, their associates, successors, and assigns, persons composing the International Ocean Telegraph Company, an incorporated company chartered by the State of New York, are desirous of establishing a line of submarine telegraphic communication between the United States of America and the West India Islands and the Bahamas: Now, therefore, in order to facilitate the said enterprise—

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the said International Ocean Telegraph Company, incorporated under the laws of the State of New York, their successors and assigns, shall have the sole privilege for a period of fourteen years from the approval of this act, to lay, construct, and operate telegraphic lines over the land, maintain, and operate telegraphic or magnetic lines or cables in land, and over the waters, reefs, islands, shores, and lands, over which the United States have jurisdiction, from the shores of the State of Florida, in the said United States, to the island of Cuba and the Bahamas, either or both, and other West India Islands.

SEC. 2. And be it further enacted, That the said International Ocean Telegraph Company shall, at all times give the United States the free use of said cable or cables, to a telegraphic operator of its own selection, to transmit any messages to and from its military, naval, and diplomatic or consular agents; and the said company shall keep all its lines open to the public for the transmission for daily publication of market and commercial reports and intelligence, and all messages, dispatches, and communications shall be forwarded in the order in which they shall be received; and the said company shall not be permitted to charge and collect for messages transmitted through any of its submarine cables more than the rate of three dollars and fifty cents for messages of ten words, subject, however, to the power of Congress to alter and determine said rates: *Provided,* That the said International Ocean Telegraph Company shall, within the period of three years from the passage of this act, cause the said submarine telegraphic cable or cables to be laid down, and that the said cable or cables shall be in successful operation for the transmission of messages within the said period of five years; otherwise, this grant to be null and void.

SEC. 3. And be it further enacted, That Congress shall have power, at any time, to alter or repeal the foregoing act.

Approved May 5, 1866.

ACT OF JULY 13, 1866.

- 14 Stat., 136. AN ACT to reduce Internal Taxation and to amend an act entitled "An Act to provide Internal Revenue to support the Government, to pay Interest on the Public Debt, and for other Purposes," approved June thirtieth, eighteen hundred and sixty-four, and Acts amendatory thereof.

Section 107 amended. That section one hundred and seven be amended by striking out all after the enacting clause, and inserting in lieu thereof the following: That any person, firm, company, or corporation owning or possessing or having the care or management of any telegraphic line by which telegraphic dispatches or messages are received or transmitted, shall be subject to and pay a tax of three per centum on the gross amount of all receipts of such person, firm, company, or corporation.

ACT OF JULY 23, 1866.

- 14 Stat., 210. AN ACT for a grant of lands to the State of Kansas to aid in the construction of the Northern Kansas Railroad and Telegraph.

(The only reference made to "the telegraph" in this act is that given in the above title.)

ACT OF JULY 24, 1866.

AN ACT to aid in the Construction of Telegraph Lines, and to secure to the Government the Use of the same for Postal, military, and other Purposes. 14 Stat. 221.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any telegraph company now organized, or which may hereafter be organized under the laws of any State in this Union, shall have the right to construct, maintain, and operate lines of telegraph through and over any portion of the public domain of the United States, over and along any of the military or post roads of the United States which have been or may hereafter be declared such by act of Congress, and over, under, or across the navigable streams or waters of the United States: *Provided,* That such lines of telegraph shall be so constructed and maintained as not to obstruct the navigation of such streams and waters, or interfere with the ordinary travel on such military or post roads. And any of said companies shall have the right to take and use from such public lands the necessary stone, timber, and other materials for its posts, piers, stations, and other needful uses in the construction, maintenance, and operation of said lines of telegraph, and may pre-empt and use such portion of the uncultivated public lands subject to pre-emption through which its said lines of telegraph may be located as may be necessary for its stations, not exceeding forty acres for each station; but such stations shall not be within fifteen miles of each other.

Sec. 2. *And be it further enacted,* That telegraphic communications between the several departments of the government of the United States and their officers and agents shall, in their transmission over the lines of any of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster-General.

Sec. 3. *And be it further enacted,* That the rights and privileges hereby granted shall not be transferred by any company acting under this act to any other corporation, association, or person: *Provided, however,* That the United States may at any time after the expiration of five years from the date of the passage of this act, for postal, military, or other any purposes, purchase all the telegraph lines, property, and effects of any or all of said companies at an appraised value, to be ascertained by five competent, disinterested persons, two of whom shall be selected by the Postmaster-General of the United States, two by the company interested, and one by the four so previously selected. [chase telegraph lines. Value to be appraised.

Sec. 4. *And be it further enacted,* That before any telegraph company shall exercise any of the powers or privileges conferred by this act, such company shall file their written acceptance with the Postmaster-General of the restrictions and obligations required by this act.

Approved July 24, 1866.

ACT OF JULY 27, 1866.

AN ACT granting Lands to aid in the Construction of a Railroad and Telegraph Line from the States of Missouri and Arkansas to the Pacific Coast. 14 Stat., 295.

* * * And there shall be constructed a telegraph line, of the most substantial and approved description, to be operated along the entire line: *Provided,* That the said company shall not charge the government higher rates than they do individuals for like transportation and telegraphic service. Atlantic and Pacific Railroad and Telegraph Line.

(See act printed in full in laws relating to Atlantic and Pacific Railroad Company, Appendix G of this report.)

RESOLUTION OF FEBRUARY 26, 1866.

JOINT RESOLUTION to encourage and facilitate Telegraphic Communication between the western and eastern Continents. 14 Stat., 350.

Whereas by an act entitled "An act to encourage and facilitate telegraphic communication between the eastern and western continents," approved July first, eighteen hundred and sixty-four, it was provided,

among other things, that the Secretary of the Navy be authorized to detail a vessel to assist in surveys and soundings, laying down submarine cable, transporting materials connected therewith, and generally afford such assistance as might be deemed best calculated to secure a successful promotion of the enterprise; and whereas the Emperor of Russia, for the purpose of co-operating with the government of the United States, under the act aforesaid, has ordered a steam corvette, the "Variag," of two thousand one hundred and fifty-six tons burthen, seventeen guns, three hundred and six men, to assist in the achievement of said telegraph, and has placed the said steamer subject to the orders of said telegraph company; and whereas said telegraph company intend, the ensuing summer, to lay the sub-marine cable required at Behring's Strait, said cable and the material for the entire line being now in transit, and the vessels of the company, seven in number, being ready at San Francisco and Vancouver for the expedition, and require immediate co-operation on the part of the United States, in conformity with said act: Therefore,

Be it resolved in the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Navy be, and he is hereby, authorized and required to detail one steam vessel from the squadron of the Pacific station, or elsewhere, to assist in making surveys and soundings in that part of the Pacific coast, both of America and Asia, where it is proposed to establish said telegraph, in laying the submerged cable, and generally to afford such assistance as may be best calculated to secure the success of the enterprise and to carry out the purposes of the act approved July first, eighteen hundred and sixty-four, entitled "An act to encourage and facilitate telegraphic communication between the eastern and western continents," so far as the same can be afforded without dismantling her, or destroying or impairing her efficiency as a vessel of war.

Approved February 26, 1866.

ACT OF MARCH 2, 1867.

14 Stat., 455.

AN ACT making Appropriations for the legislative, executive, and judicial Expenses of the Government for the Year ending the thirtieth of June, eighteen hundred and sixty-eight, and for other Purposes.

For facilitating communication by telegraph.

For facilitating communication between the Atlantic and Pacific States by electrical telegraph, forty thousand dollars.

ACT OF MARCH 2, 1867.

14 Stat., 470.

AN ACT making Appropriations and to supply Deficiencies in the Appropriations for the Service of the Government for the fiscal Year ending June thirtieth, eighteen hundred and sixty-seven, and for other Purposes.

Expenses of Atlantic cable dispatches.

For defraying the expenses incurred by the Department of State by sending telegraphic despatches over the Atlantic cable, thirty thousand dollars for the current year.

ACT OF MARCH 29, 1867.

15 Stat., 10.

AN ACT to grant to the American Atlantic Cable Telegraph Company, of New York the Right of Way and Privilege to lay, land, and operate a Submarine Telegraph Cable on the Atlantic Coast of the United States, and establish Telegraph Communication between the United States and Europe, via the Bermudas and Azores Islands.

American Atlantic Cable Telegraph Company authorized to lay and operate cables on the Atlan-

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the American Atlantic Cable Telegraph Company, of New York, be, and are hereby, vested with the right, power, and privilege, having acquired the necessary land therefor, to lay, land, and operate their cable or cables on the Atlantic coast.

except the coast of Florida, within the jurisdiction of the United States, and the right, power, and privilege so to lay, land, and operate their cable or cables shall be vested in the said American Atlantic Cable Telegraph Company for the period of twenty years from the approval of this act: *Provided*, That the said company shall commence active operations within the space of two years from the approval of this act.

SEC. 2. *And be it further enacted*, That the American Atlantic Cable Telegraph Company, having acquired the necessary land therefor, shall have the right, power, and privilege to lay, land, and operate their cable or cables within any of the harbors, waters, inlets, towns, and cities on the Atlantic coast, except the coast of Florida, offering the most practical and convenient landing, and to construct or erect all the necessary fixtures to accomplish the object of this act.

SEC. 3. *And be it further enacted*, That the government of the United States shall at all times have the preference in its use, upon terms that may be agreed upon between the Postmaster-General and the said company.

SEC. 4. *And be it further enacted*, That Congress shall have power to alter, amend, or repeal this act.

Approved March 29, 1867.

ACT OF JUNE 25, 1868.

AN ACT to amend an Act entitled "An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the Central Pacific Railroad, in California, to Portland, in Oregon." 15 Stat., 80.

(See act printed in full in laws relating to California and Oregon Railroad Company; Appendix G of this report.)

ACT OF JULY 20, 1868.

AN ACT making Appropriations for the sundry civil Expenses of the Government for the Year ending June thirty, eighteen hundred and sixty-nine, and for other Purposes. 15 Stat., 111.

For facilitating communication between the Atlantic and Pacific States by electrical telegraph, forty thousand dollars. For facilitating communications by telegraph.

ACT OF JULY 25, 1868.

AN ACT making Appropriations and to supply Deficiencies in the Appropriations for the Service of the Government for the fiscal Year ending June thirtieth, eighteen hundred and sixty-eight, and for other Purposes. 15 Stat., 173.

For facilitating communication between the Atlantic and Pacific States by electrical telegraph (to supply deficiency for the fiscal year ending June thirtieth, eighteen hundred and sixty-seven), forty thousand dollars. To facilitate communication by telegraph.

ACT OF MARCH 3, 1869.

AN ACT making Appropriations for sundry civil Expenses of the Government for the Year ending June thirtieth, eighteen hundred and seventy, and for other purposes. 15 Stat., 302.

For facilitating communication between the Atlantic and Pacific States by electrical telegraph, forty thousand dollars. To facilitate communication by telegraph.

ACT OF MARCH 3, 1869.

AN ACT to authorize the Transfer of Lands granted to the Union Pacific Railway Company, Eastern Division, between Denver and the Point of its Connection with the Union Pacific Railroad, to the Denver Pacific Railway and Telegraph Company, and to expedite the Completion of Railroads to Denver, in the Territory of Colorado. 15 Stat., 324.

(See act printed in full in Report of Auditor of Railroad Accounts for 1879, p. 128.)

- 15 Stat., 506. TREATY between the United States of America and the Sisseton and Warpeton bands of Dakota or Sioux Indians; Concluded February 19, 1867.

Telegraph lines may be constructed across Sioux lands. ARTICLE II. The said bands hereby cede to the United States the right to construct wagon-roads, railroads, mail stations, telegraph lines, and such other public improvements as the interest of the government may require, over and across the lands claimed by said bands (including their reservation as hereinafter designated) over any route or routes that *that* may be selected by authority of the government, said lands also claimed being bounded on the south and east by the treaty line of 1851 and the Red river of the North to the mouth of Goose river, on the north by the Goose river and a line running from the source thereof by the most westerly point of Devil's lake to the Chief's Bluff at the head of James river, and on the west by the James river to the mouth of Mocasín river, and thence to Kampeska lake.

Boundaries of lands.

ACT OF APRIL 10, 1869.

- 16 Stat., 47. AN ACT to amend an Act entitled "An Act granting Lands to aid in the Construction of a Railroad and Telegraph Line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July twenty-five, eighteen hundred and sixty-six.

(See act printed in full in laws relating to California and Oregon Railroad Company, Appendix G of this report.)

ACT OF APRIL 20, 1870.

- 16 Stat., 90. AN ACT making Appropriations to supply Deficiencies in the Appropriations for the Service of the Government for the fiscal Year ending June thirty, eighteen hundred and seventy, and for other Purposes.

Northern Lakes and Seaboard.—For expenses of the observation and report of storms, by telegraph and signal, for the benefit of the commerce of the northern lakes and seaboard, fifteen thousand dollars.

ACT OF MAY 4, 1870.

- 16 Stat., 94. AN ACT granting Lands to aid in the Construction of a Railroad and Telegraph Line from Portland to Astoria and McMinnville, in the State of Oregon.

(See act printed in full in laws relating to Oregon Central Railroad Company, Appendix G of this report.)

JOINT RESOLUTION OF FEBRUARY 9, 1870.

- 16 Stat., 309. JOINT RESOLUTION to authorize the Secretary of War to provide for taking the meteorological Observations at the military Stations and other Points in the Interior of the Continent, and for giving Notice on the northern Lakes and Seaboard of the Approach and Force of Storms.

Rev. Stat., sec. 221. *Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he hereby is, authorized and required to provide for taking meteorological observations at the military stations in the interior of the continent, and at other points in the States and Territories of the United States, and for giving notice on the northern lakes and on the sea-coast, by magnetic telegraph and marine signals, of the approach and force of storms.*

ACT OF MARCH 3, 1871.

AN ACT making Appropriations for sundry civil Expenses of the Government for the fiscal Year ending June thirty, eighteen hundred and seventy-two, and for other Purposes. 16 Stat., 497 and 507.

For facilitating communication between the Atlantic and Pacific States by electric telegraph, forty thousand dollars: *Provided*, That no part of this amount shall be paid to any company which shall refuse or neglect to perform telegraphic service for the government of the United States in accordance with the provisions of an act entitled "An act to aid in the construction of telegraph lines, and to secure [to] the government the use of the same for postal, military, and other purposes," approved July twenty-four, eighteen hundred and sixty-six. 14 Stat., 221.

Signal Office.—For manufacture, purchase, or repair [of] meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing probable approach and force of storms; for instrument shelters; for hire, furniture, and expense of offices maintained for public use in cities or ports receiving reports; for maps and bulletins, to be displayed in chambers of commerce and boards-of-trade rooms; for books and stationery; and for incidental expenses not otherwise provided for, one hundred and two thousand four hundred and fifty-one dollars: *Provided*, That no part of this appropriation, nor of any appropriation for the several departments of the government, shall be expended for telegraphing between said departments and their officers or agents, except at rates first to be established by the Postmaster-General, under section two of chapter two hundred and thirty of the statutes of eighteen hundred and sixty-six. Rates to be established by the Postmaster-General. 14 Stat., 221.

ACT OF MARCH 3, 1871.

AN ACT making Appropriations to supply Deficiencies in the Appropriations for the Service of the Government for the fiscal Years ending June thirty, eighteen hundred and seventy, and June thirty, eighteen hundred and seventy-one and for former years, and for other Purposes. 16 Stat., 516 and 520.

For executing contract to facilitate communication between the Atlantic and Pacific States by electric telegraph, forty thousand dollars. For facilitating communication between the Atlantic and Pacific.

Signal office.—Observation and report of storms: For expenses of the manufacture, purchase, or repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing probable approach and force of storms; for instrument shelters; for hire and expense of offices maintained for public use in cities or ports receiving reports; for maps, bulletins, to be displayed in chambers of commerce and board-of-trade rooms; for books and stationery and for incidental expenses not otherwise provided for, twenty-nine thousand two hundred dollars: *Provided*, That no part of this appropriation shall be expended for telegraphing at greater rates than those which are or may be fixed by the Postmaster-General, in pursuance of the second section of chapter two hundred and thirty of the statutes of eighteen hundred and sixty-six. At rates to be fixed by the Postmaster-General.

ACT OF MARCH 3, 1871.

AN ACT making Appropriations for the Support of the Army for the Year ending June thirty, eighteen hundred and seventy-two, and for other Purposes. 16 Stat., 525.

SEC. 7. That the Secretary of War be, and he is hereby, authorized and directed to negotiate with a responsible party to build and operate a telegraph line from Yankton, Dakota Territory, to Fort Randall, Dakota, and thence to Fort Sully, if, in the opinion of the Secretary of War, it is deemed expedient. Construction of a telegraph line from Yankton to Fort Randall and Fort Sully.

\$80 per mile.

Money to be re-
funded in the use
of the line.

When refunded
the United States
lien ceases.

tary of War, the public service demands such extension. And upon the completion of each hundred miles of said line to the satisfaction of the Secretary of War, he is authorized to pay the party constructing the same the sum of eight thousand dollars; and upon the completion of the whole line he shall pay, as aforesaid, the sum of eighty dollars per mile for any number of miles the same may extend over the number of even hundreds: *Provided*, That the money so paid shall be refunded to the United States in the use of said telegraph line at rates not higher than charged private individuals, nor higher than may, in the opinion of said Secretary, be just: *Provided also*, that when the money advanced by the said Secretary of War shall be refunded, as above provided, the United States shall have no title to nor lien upon said line, but may at all times use the same for public purposes at such rates as may be just.

ACT OF MARCH 3, 1871.

16 Stat., 574. AN ACT to incorporate the Texas Pacific Railroad Company, and to aid in the Construction of its Road, and for other Purposes.

(See act printed in full in laws relating to Texas Pacific Railroad Company, Appendix G of this report.)

ACT OF MAY 18, 1872,

17 Stat., 129. AN ACT making Appropriations to supply Deficiencies in the Appropriations for the Service of the Government for the fiscal Year ending June thirty, eighteen hundred and seventy-two, and for former Years, and for other purposes.

* * * * *

Telegraphing
reports and
storm-signals.

Signal Office.—Observation and report of storms: For manufacture, purchase, or repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals, announcing probable approach and force of storms; for instrument-shelters; for hire, furniture, and expense of offices maintained for public use in cities or posts receiving reports; for maps, bulletins, and so forth, to be displayed in chambers of commerce and board of trade rooms, and for distribution; for books and stationery; and for incidental expenses not otherwise provided for, sixty-one thousand and fifty dollars: *Pro-*

No money to be
paid to any tele-
graph company
refusing to com-
ply with provi-
sions of act of 1866.

Act of 1866, sec.
2, vol. xiv, p. 221.

vided, That no part of this appropriation, nor of any appropriation for the several departments of the government, shall be paid to any telegraphic company which shall neglect or refuse to transmit telegraphic communications between said departments, their officers, agents, or employees, under the provisions of the second section of chapter two hundred and thirty of the statutes of the United States for the year eighteen hundred and sixty-six, and at rates of compensation therefor to be established by the postmaster-general.

ACT OF JUNE 8, 1872.

17 Stat., 287. AN ACT to revise, consolidate, and amend the Statutes relating to the Post-office Department.

* * * * *

Sec. 5266, Rev.
Stat.

Government
telegrams over
certain lines to
have priority.

SEC. 17. That telegrams between the several departments of the government and their officers and agents, in their transmission over the lines of any company to which has been given the right of way, timber, or station lands from the public domain, shall have priority over all other business, at such rates as the Postmaster-General shall annually fix.

ACT OF JUNE 10, 1872.

AN ACT making Appropriations for sundry civil Expenses of the Government for the fiscal Year ending June thirtieth, eighteen hundred and seventy-three, and for other Purposes.

17 Stat., 366.

Signal-Office.—For manufacture, purchase, or repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing probable approach and force of storms throughout the United States, for the benefit of commerce and agriculture; for instrument-shelters; for hire, furniture, and expenses of offices maintained for public use in cities or posts receiving reports; for maps and bulletins, to be displayed in chambers of commerce and boards-of-trade rooms; for books and stationery; and for incidental expenses not otherwise provided for, two hundred and fifty thousand dollars: *Provided*, That the Secretary of War be, and he hereby is, authorized and required to provide, in the system of observations and reports in charge of the chief signal officer of the army, for such stations, reports, and signals as may be found necessary for the benefit of agriculture and commercial interests: *And provided*, That no part of this appropriation nor of any appropriation for the several departments of the government, shall be paid to any telegraphic company which shall neglect or refuse to transmit telegraphic communications between said departments, their officers, agents, or employees, under the provisions of the second section of chapter two hundred and thirty of the statutes of the United States for the year eighteen hundred and sixty-six, and at rates of compensation therefor to be established by the Postmaster-General: *Provided also*, That whenever any telegraph company shall have filed its written acceptance with the Postmaster-General, of the restrictions and obligations required by the act approved July twenty-fourth, eighteen hundred and sixty-six, entitled "An act to aid in the construction of telegraph lines, and to secure to the government the use of the same, for postal, military, and other purposes," if such company, its agents, or employees shall hereafter refuse or neglect to transmit any such telegraphic communications as are provided for by the aforesaid act, or by the joint resolution approved the ninth day of February, eighteen hundred and seventy, "to authorize the Secretary of War to provide for taking meteorological observations at the military stations and other points of the interior of the continent, and for giving notice on the northern lakes and seaboard of the approach and force of storms," such telegraphic company shall forfeit and pay to the United States not less than one hundred and not exceeding one thousand dollars for each refusal or neglect aforesaid, to be recovered by an action or actions at law, in any district court of the United States.

Telegraphing reports and storm signals.

Sec. 5266, Rev. Stat.

No money to be paid to any telegraph company not complying with act of 1866, sec. 2, vol. xiv, p. 221.

Sec. 5269, Rev. Stat.

Penalty for refusing to transmit messages.

ACT OF FEBRUARY 27, 1873.

AN ACT to authorize the Northern Pacific Railroad Company to construct and maintain a Bridge across the Saint Louis River.

17 Stat., 478.

And the United States shall have the right of way for postal-telegraph purposes across such bridge.

Postal-telegraph service.

ACT OF MARCH 3, 1873.

AN ACT making Appropriations for sundry civil Expenses of the Government for the fiscal Year ending June thirtieth, eighteen hundred and seventy-four, and for other Purposes.

17 Stat., 519 and 528.

For connecting the capitol by telegraph, to be used solely for public business, with all the departments of government and the government printing office in the city of Washington, eight thousand dollars, or so much thereof as may be necessary, to be expended under the direction of the officer in charge of the public buildings and grounds: *Provided*, that the immediate connection of the wires with any of the public buildings shall be made under ground, or in such manner as not to injure the appearance of the Capitol or other public buildings.

Telegraph to connect Capitol with the departments.

Immediate connection with buildings—wires to be under ground.

Military tele- For the construction of a military telegraph from San Diego, California, via Fort Yuma and Maricopa Wells, to Prescott and Tucson, Arizona, fifty thousand three hundred and eleven dollars and eighty cents.

ACT OF MARCH 3, 1873.

17 Stat., 556. AN ACT making Appropriations for the naval Service for the Year ending June thirtieth, eighteen hundred and seventy-four, and for other Purposes.

Telegraphing. For contingencies, namely: freight; ferriage; toll; cartage; wharfage; purchase and repair of boats; labor; burial of deceased marines; stationery; telegraphing; apprehension of deserters; &c., &c., twenty-five thousand dollars: *Provided*, That the Secretary of the Navy be, and he hereby is, authorized to make soundings between the western coast of the United States and Japan, for scientific purposes, and for the purpose of determining the practicability of laying a telegraph cable between those points: *Provided*, That no appropriation of money shall be made for such purpose.

Soundings authorized between coast of the United States and Japan, for cable purposes.

ACT OF FEBRUARY 4, 1874.

18 Stat., 14. AN ACT in relation to the lines of telegraph connecting the Capitol with the various Departments of the Government.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the lines of telegraph connecting the Capitol with the various Departments in Washington, constructed under and by virtue of the act of Congress approved March third, eighteen hundred and seventy-three, entitled "An act making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-four, and for other purposes," be, and the same are hereby, placed under the supervision of the officer in charge of the public buildings and grounds; and that the said officer be authorized and empowered to make rules and regulations for the working of said lines. And the secretary or Head of each Executive Department, and the Congressional Printer are hereby authorized to detail one person from their present force of employees to operate the instruments in said Departments and printing office, and each House of Congress may provide for the employment of an operator in their respective wings of the Capitol, at a compensation not exceeding one hundred dollars per month during the sessions of Congress.

Approved February 4, 1874.

ACT OF JUNE 3, 1874.

18 Stat., 51. AN ACT to provide for the better protection of the frontier settlements of Texas against Indian and Mexican depredations.

Sec. 223, Rev. Stat. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Secretary of War be, and he is hereby, authorized to construct and operate a line of telegraph, beginning at or near the city of Denison, in Grayson County, Texas; thence by the nearest practicable route to Fort Sill, Indian Territory; thence to Fort Richardson, Texas; thence along the northern frontier-line of settlements to Forts Griffin and Concho; thence to the Pecos River, at or near the mouth of Toyah Creek; thence to Fort Clarke, on Las Moras Creek; thence to Fort Duncan, on the Rio Grande; thence down the Rio Grande, via Fort McIntosh and Ringold's Barracks, to Brownsville, so as to connect the military posts which are now, or may hereafter be, established on said line with the military head-quarters of said district; and that the sum of one hundred thousand dollars, or so much thereof as may be necessary, be, and the same is hereby, appropriated out of any money in the treasury of the United States not otherwise appropriated.

\$100,000 appropriated.

Approved June 3, 1874.

ACT OF JUNE 20, 1874.

AN ACT making additions to the fifteenth section of the act approved July 2, 1864, entitled "An act to amend an act entitled 'An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the Government the use of the same for postal, military, and other purposes,' approved July 1, 1862." 18 Stat., 111.

(See act printed in full in Report of Auditor of Railroad Accounts for 1879, p. 132.)

ACT OF JUNE 23, 1874.

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-five, and for other purposes. 18 Stat., 209 and 223.

For necessary repairs of the telegraph-line connecting the Capitol and Executive Departments, one thousand dollars. Repair of department telegraph.

Signal Office.—Observation and report of storms: For expenses of the observation and report of storms by telegraph and signals, for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, or repair of meteorological or other necessary instruments; for telegraphing reports; for expenses of storm-signals, announcing probable approach and force of storms; for continuing the establishment and connection of stations at life-saving stations and light-houses; for instrument-shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river-reports; for maps and bulletins to be displayed in chambers of commerce and boards-of-trade rooms and for distribution; for books and stationery; and for incidental expenses not otherwise provided for, three hundred and fifty-five thousand three hundred and twenty-five dollars. Telegraphing reports and storm-signals.

To enable the Secretary of War to extend the line of military telegraph from Prescott to Camp Verde and Camp Apache in Arizona, four thousand dollars: *Provided*, That the Secretary of War be, and he is hereby, authorized to pay the expenses of operating and keeping in repair the telegraph-lines constructed and operated by the War Department, in said Territory, out of any moneys received for despatches sent over said lines; any balance remaining after the payment of such expenses to be covered into the Treasury as a miscellaneous receipt; the moneys received in any one fiscal year to be used only in payment for the expenses of that year. And a full report of the receipts and expenditures in connection with the said telegraph-lines shall be made quarterly to the Secretary of War through the Chief Signal-Officer. And the Chief Signal Officer shall have the charge and control of said lines of telegraph in the construction, repair, and operation of the same. Military telegraphs in Arizona. Expenses to be paid out of receipts. Quarterly reports to Secretary of War. In the control of the Chief Signal Officer.

ACT OF JUNE 23, 1874.

AN ACT to protect lines of telegraph constructed or used by the United States from malicious injury and obstruction. 18 Stat., 250.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person or persons who shall wilfully or maliciously injure or destroy any of the works or property or material of any telegraphic line constructed and owned, or in process of construction, by the United States, or that may be hereafter constructed and owned or occupied and controlled by the United States, or who shall wilfully or maliciously interfere in any way with the working or use of any such telegraph line, or who shall wilfully or maliciously obstruct, hinder, or delay the transmission of any communication over any such telegraphic line, shall be deemed guilty of a misdemeanor, and, on conviction thereof in any district court of the United States having jurisdiction of the same, shall be punished by a fine of not less than one hundred nor more than one thousand dollars, or with imprisonment for a term not exceeding three years, or with both, in the discretion of the court. Injury to telegraph lines owned by United States. Jurisdiction. Fine of \$100 or \$1,000.

Approved June 23, 1874.

ACT OF MARCH 3, 1875.

18 Stat., 385 and 388. AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-six, and for other purposes.

Telegraph poles to be removed from Capitol grounds. And the telegraph-companies having offices in the Capitol are directed to take from the Capitol Grounds, and the streets around the same, all telegraph poles, and connect these lines with the Capitol by means of cables laid underground.

Telegraphing reports. *Signal Office.*—Observation and report of storms: For expenses of the observation and report of storms by telegraph and signals, for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, or repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals, announcing probable approach and force of storms; for continuing the establishment and connection of stations at life-saving stations and light-houses; for instrument-shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river-reports; for maps and bulletins to be displayed in chambers of commerce and boards-of-trade rooms, and for distribution; for books and stationery; and for incidental expenses not otherwise provided for; four hundred and fifteen thousand dollars; thirty thousand dollars of which shall be expended on the Atlantic coast south of Cape Hatteras: *Provided*, That no expenditure shall be made or obligation incurred for any amount in excess of the sum hereby appropriated.

Construction of telegraph-lines on Indian and Mexican frontiers. For completing the construction, and for maintenance and use of military telegraph-lines on the Indian and Mexican frontiers, and for the connection of military posts and stations, for the better protection of immigration and the frontier settlements from depredations, especially in the State of Texas, the Territories of New Mexico and Arizona, and the Indian Territory, eighty-eight thousand dollars: *Provided*, That the Secretary of War be, and he is hereby, authorized to

Connection of military posts. pay the expenses of operating and keeping in repair the said telegraph-lines out of any money received for dispatches sent over said lines; any balance remaining after the payment of such expenses to be covered into the Treasury as a miscellaneous receipt; the money received in any one fiscal year to be used only in payment for the expenses of that year. And a full report of the receipts and expenditures in connection with the said telegraph-lines shall be made quarterly to the Secretary of War through the Chief Signal Officer. And the Chief Signal Officer shall have the charge and control of said lines of telegraph in the construction, repair, and operation of the same, And so much of this

Chief Signal Officer to have charge and control. appropriation as may be necessary, not to exceed thirty thousand dollars in all, shall be used in constructing a telegraph-line from Fort Marcy to Fort Bayard, in New-Mexico, and from Fort Bayard to Camp Grant, in Arizona.

18 Stat., 685. TREATY between the United States of America and the Eastern bands of Shoshonee Indians, concluded July 2, 1863.

Telegraph-lines in Shoshonee country to be protected. ART. III. The telegraph and overland stage lines having been established and operated through a part of the Shoshonee country, it is expressly agreed that the same may be continued without hindrance, molestation, or injury from the people of said nation; and that their property, and the lives of passengers in the stages, and of the employees of the respective companies shall be protected by them.

18 Stat., 689. TREATY between the United States of America and the Western bands of Shoshonee Indians, concluded October 1, 1863.

Telegraph-lines in the Shoshonee country to be protected. ART. III. The telegraph and overland stage lines having been established and operated by companies under the authority of the United States through a part of the Shoshonee country, it is expressly agreed that the same may be continued without hindrance, molestation, or injury from the people of said bands, and that their property and the lives and property of passengers in the stages and of the employees of the respective companies shall be protected by them.

ACT OF JULY 31, 1876.

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-seven, and for other purposes. 19 Stat., 118.

Signal Office.—For expenses of the observation and report of storms by telegraph and signal for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, or repair of meteorological and other necessary instruments for telegraphing reports; for expenses of storm-signals, announcing probable approach and force of storms; for continuing the establishment and connection of stations at lifesaving stations and light-houses; for instrument shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river-reports; for books, periodicals, newspaper, and stationery; and for incidental expenses not otherwise provided for, three hundred thousand dollars. Telegraphing reports.

Construction, maintenance, and repair of military telegraph lines.—For completing the construction, maintenance, and use of military telegraph lines on Indian and Mexican frontiers, and for the connection of military posts and stations, for the better protection of emigration and the frontier settlements from depredations, especially in the State of Texas, the Territories of New Mexico and Arizona and the Indian Territory, under the provisions of the act approved March third, eighteen hundred and seventy-five, forty-five thousand dollars. Construction of military telegraph lines. Act of 1875, § Stat., 388. Act of 1874, 18 Stat., 51.

ACT OF AUGUST 15, 1876.

AN ACT to encourage and promote telegraphic communication between America and Asia. 19 Stat., 201.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Celso Cirsar Moreno Alvinza Hayward, John F. Miller, Leland Stanford, Mark Hopkins, James C. Flood, William Irwin, James McM. Shafter, O. H. La Grange, Isaac Friedlander, William Alvord, Eugene L. Sullivan, John P. Jackson, Andrew J. Bryant, John B. Felton, Louis Sloss, Philip A. Roach, Nathaniel W. Spaulding, William Norris, Frank M. Pixley, and J. Craig, of the State of California; Henry Failing and Julius Friedman, of the State of Oregon; Henry O'Reilly and William Barnett Phillips, of the State of New York; Dudley S. Gregory, of the State of New Jersey, shall have the right to construct, lay, land, and maintain a line or lines of telegraph or submarine cable or cables on the Pacific coast of the United States of America, to connect the American and Asiatic coasts by telegraph lines, wires, or submarine cables: *Provided*, That said company shall begin to lay said cable or cables within three years from the passage of this act. Right given to lay a cable between Asia and America. Limited to three years.

SEC. 2. That any telegraph-line or cable laid by said company shall be subject to the following conditions, stipulations, and reservations, to wit: The Government of the United States shall be entitled to exercise and enjoy the same or similar privileges with regard to the control and use of such line or lines or cable or cables that may, by law, agreement, or otherwise, be exercised and enjoyed by any foreign government whatever; secondly, citizens of the United States shall enjoy the same privileges as to the payment of rates for the transmission of messages as are enjoyed by the citizens of the most favored nations; thirdly, the transmission of despatches shall be made in the following order: first, despatches of state, under such regulations as may be agreed upon by the governments interested; secondly, despatches on telegraphic service; and, thirdly, private despatches; fourthly, the lines of any such cables shall be kept open to the public for the daily transmission of market and commercial reports and intelligence, and all messages, despatches, and communications, shall be forwarded in the order in which they are received, except as hereinafter provided; fifthly, before extending and establishing any such line or lines or cable or cables in or over any waters, reefs, islands, shores, and lands within the jurisdiction of the United States, a written acceptance of the terms and conditions imposed by this act shall be filed in the office of the Secretary of State by the said company. Conditions, stipulations, and reservations. Use by government. Use by citizens of the United States. Order of transmission of despatches. Acceptance to be filed in the State Department.

Similar privileges may be granted to other persons.

Congress reserves the right to alter, amend, or repeal.

SEC. 3. But nothing in this act shall be construed to limit the United States in granting to other persons or companies similar privileges herein contained.

SEC. 4. That the right to alter, amend or repeal this act at any time is hereby reserved to Congress.

Approved August 15, 1876.

ACT OF FEBRUARY 20, 1877.

19 Stat., 232. AN ACT to encourage and promote telegraphic communication between America and Europe.

Sec. 5263, Rev. Stat.

Right to lay telegraph cables between Europe and America.

Limited to three years.

Charges to be reduced one-third.

Union or sale to any other company prohibited.

Sec. 5269, Rev. Stat.

Conditions and stipulations.

Use by the United States.

Use by citizens of the United States.

Order of transmission of dispatches.

Acceptance to be filed in the Department of State.

Grants may be made to other persons.

Congress reserves the right to alter, amend, or repeal.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Ferdinand C. Latrobe, William F. Frick, and Robert Garrett, of Maryland, shall have the right to construct, lay, land, and maintain a line or lines of telegraph, or submarine cables, on the Atlantic coast of the United States of America, to connect the American and European coasts by telegraphic lines, wires, or submarine cables: Provided, That at least one cable shall be laid and operating between Europe and the Atlantic coast of the United States within three years from the approval of this act; and the at present tariff-rates of messages shall be reduced to one-third or one shilling British currency, per word, over said new cable or cables: And provided, That no amalgamation, union, or sale of cable interests established under this act shall be made to any existing European or other cable-companies.

SEC. 2. That any telegraph line or cable laid be subject to the following conditions, stipulations, and reservations, to wit: FIRST. The Government of the United States shall be entitled to exercise and enjoy the same or similar privileges with regard to the control and use of such line or lines, or cable or cables, as there may, by law, agreement, or otherwise, be exercised and enjoyed by any foreign government whatever. SECONDLY. Citizens of the United States shall enjoy the same privileges as to the payment of rates for the transmission of messages as are enjoyed by the citizens of the most favored nations. THIRDLY. The transmission of dispatches shall be made in the following order: FIRST, dispatches of state, under such regulations as may be agreed upon by the governments interested, the rates not to exceed those charged to individuals; secondly, dispatches on telegraphic service; and thirdly, private dispatches. Fourthly. The lines of any such cables shall be kept open to the public for the daily transmission of market and commercial reports and intelligence, and all messages, dispatches, and communications shall be forwarded in the order in which they are received, except as hereinbefore provided. Fifthly. Before extending and establishing any such line or lines, or cable or cables, in or over any waters, reefs, islands, shores, and lands within the jurisdiction of the United States, a written acceptance of the terms and conditions imposed by this act shall be filed in the office of the Secretary of State by the said company.

SEC. 3. That nothing in this act shall be construed to limit the United States in granting to other persons or companies similar privileges herein contained.

SEC. 4. That the right to alter, amend, or repeal this act at any time is hereby reserved to Congress.

Approved February 20, 1877.

ACT OF MARCH 3, 1877.

19 Stat., 350. AN ACT making appropriations for sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and seventy-eight: and for other purposes.

Departmental telegraph.

For repairs and care of the telegraph to connect the Capitol with the Departments and the Public Printing Office, five hundred dollars.

Signal Office:—For expenses of the observation and report of storms by telegraph and signal for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, or repair

of meteorological and other necessary instruments for telegraphing reports; for expenses of storm-signals, announcing probable approach and force of storms; for continuing the establishment and connection of stations at life saving stations and light houses; for instrument shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river reports; for books, periodicals, newspapers and stationery; and for incidental expenses not otherwise provided for, three hundred thousand dollars. Telegraphing reports.

Construction, maintenance and repair of military telegraph lines.—For the construction and continuing the construction maintenance and use of military telegraph lines on the Indian and Mexican frontiers for the connection of military posts and stations and for the better protection of immigration and the frontier settlements from depredations, especially in the State of Texas and the Territories of New Mexico and Arizona and the Indian Territory, under the provisions of the act approved March third, eighteen hundred and seventy-five, twenty-two thousand five hundred dollars. Construction of military telegraph lines.
Act of 1874, 18 Stat., 51.
Act of 1875, 18 Stat., 388.

ACT OF JUNE 20, 1878.

AN ACT making appropriations for sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and seventy-nine, and for other purposes. 20 Stat., 219 and

Signal Service.—Observation and report of storms: For the expenses of the observation and report of storms by telegraph and signal for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, and repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing the probable approach and force of storms; for continuing the establishment and connection of stations at life-saving stations and light-houses; for instrument shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river reports; for maps and bulletins to be displayed in chambers of commerce and boards of trade rooms, and for distribution; for books, periodicals, newspapers, and stationery; and for incidental expenses not otherwise provided for, three hundred and fifty thousand dollars. Telegraphing reports.

Construction, maintenance and repair of military telegraph lines.—For the construction and continuing the construction, maintenance, and use of military telegraph lines on the Indian and Mexican frontiers, for the connection of military posts and stations, and for the better protection of immigration and the frontier settlements from depredations, especially in the State of Texas and the Territories of New Mexico and Arizona and the Indian Territory, under the provisions of the act approved March third, eighteen hundred and seventy-five, forty thousand dollars. Construction of military telegraph lines.
Act of 1875, 18 Stat., 388.

For constructing, under the direction of the Secretary of War, a military telegraph line from Bismarck to Fort Ellis, via the Missouri and Yellowstone Rivers, connecting Fort Buford, Fort Keogh, and Fort Custer, and from Fort Sully to Fort Keogh, via Deadwood, fifty thousand dollars, or so much thereof as may be necessary. And the Secretary of War is hereby authorized to pay the expenses of operating and keeping the said telegraph line in repair out of moneys appropriated and to be appropriated for the maintenance of the Army: *Provided, however*, That private dispatches of lawful nature may be transmitted over said line whenever the same is not needed for public use, at reasonable rates, not to exceed the usual rates charged by private telegraph companies, the proceeds thereof to be accounted for and paid into the Treasury of the United States; and the said telegraph line shall be maintained and operated under such proper rules and orders as the Secretary of War may direct for the benefit of the public service. Construction of telegraph line from Bismarck to Fort Ellis.
Private dispatches may be transmitted.

Telegraph to connect the Capitol with the departments and the Government Printing Office.—For repair and care of the same, one thousand dollars. Departmenta telegraph.

ACT OF DECEMBER 13, 1878.

20 Stat., 257. AN ACT to aid in the protection of the public buildings and property against loss and damage by fire.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a commission composed of the Commissioner of Patents, the Supervising Architect of the Treasury Department, and the Secretary of the Smithsonian Institution is hereby constituted and authorized to examine such automatic signal telegraph systems as may be submitted to them by the owners and agents thereof, and to ascertain which of the same is best adapted for the purpose of the earliest and most certain transmission by signal of the occurrence of fire, and also the adaptability, usefulness, and need of the same for the further protection of the buildings and property of the government in the several departments in Washington, and to report the results of their examination to the next session of Congress.

Approved December 13, 1878.

ACT OF MARCH 3, 1879.

20 Stat., 386 and 388. AN ACT making appropriations for sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for other purposes.

* * * * *

Signal Service.—Observation and report of storms: For the expenses of the observation and report of storms by telegraph and signal for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, and repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing the probable approach and force of storms; for continuing the establishment and connection of stations at lifesaving stations and lighthouses; for instrument shelters; for hire, furniture, and expenses of offices maintained for public use in cities or ports receiving reports; for river reports; for maps and bulletins to be displayed in chambers of commerce and boards of trade rooms, and for distribution; for books, periodicals, newspapers, and stationery; and for incidental expenses not otherwise provided for, three hundred and seventy-five thousand dollars.

Construction, maintenance, and repair of military telegraph lines.—For the construction and continuing the construction, maintenance, and use of military telegraph lines on the Indian and Mexican frontiers and in the northwest, for the connection of military posts and stations and for the better protection of immigration and the frontier settlements from depredations, especially in the State of Texas and the Territories of New Mexico, Arizona, Dakota, Montana, Idaho, and Wyoming, and the Indian Territory, fifty thousand dollars, under the provisions of the act approved March third, eighteen hundred and seventy-five.

Extension of military telegraph lines from Fort Buford by way of the new post on the Milk River, Fort Benton and Fort Shaw to Helena, Dakota Territory, twenty thousand dollars.

From Fort Elliott westward. For the extension of the military telegraph lines from Fort Elliott, Texas, westward, twenty thousand dollars.

ACT OF MARCH 3, 1879.

20 Stat., 478. AN ACT to provide for taking the tenth and subsequent censuses.

* * * * *

Reports from telegraph companies. * * * He shall also in like manner require and obtain, from the owners, proprietors, or managers of every telegraph company, the following facts to wit: Name of corporation or company; terminal points con-

nected; capital and capital paid up; length of lines in miles; miles of wire; number of officers; number of persons engaged in general administration; number of persons engaged as telegraph-operators; the number of messages transmitted by officers of the United States; the number of messages transmitted for the press; the number of messages transmitted for private parties; total number of messages transmitted; total receipts from messages; total expenditures of the company, exhibiting separately the amount expended for salaries, for repairs, and for general expenses.

Laws of the Forty-sixth Congress relating to the telegraph.

ACT OF JUNE 23, 1879.

AN ACT making appropriations for the support of the Army for the fiscal year ending June thirtieth, eighteen hundred and eighty, and for other purposes. 21 Stat., 31.

* * * * *

For cost of telegrams; and telegrams are authorized to be transmitted by railroad companies which may have telegraph lines, and which shall file their written acceptance of the restrictions and obligations imposed on telegraph companies by Title Sixty-five of the Revised Statutes, for the government and for the general public, at rates to be fixed by the government, according to the provisions of Title Sixty-five of the Revised Statutes; and also for compensation of citizen witnesses attending upon courts-martial, military commissions, courts of inquiry; traveling expenses of paymasters' clerks, seventy thousand dollars. Telegrams may be transmitted by railroad companies. Rev. Stat., Title 65.

JOINT RESOLUTION OF JUNE 20, 1879.

JOINT RESOLUTION, to repeal certain clauses in the sundry civil appropriation act approved March third, eighteen hundred and seventy-nine, and for other purposes. 21 Stat., 51.

* * * * *

That the paragraph in said act relating to the extension of the military telegraph lines from Fort Buford to Helena, Dakota Territory, be amended so as to read as follows, namely: "For the extension of the military telegraph lines to Helena, Montana Territory, and the new post on the Milk River, and such other points as may be necessary, twenty thousand dollars." Construction of military telegraphs.

That the paragraph in said act relating to the extension of the military telegraph lines from Fort Elliott, Texas, westward, be amended so as to read as follows, namely: "For the extension of the military telegraph lines to Fort Elliott, Texas, and westward, as may be necessary, twenty thousand dollars."

ACT OF JANUARY 14, 1880.

AN ACT to authorize the laying of a telegraphic cable from the main land in Rhode Island to Block Island. 21 Stat., 60.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of fifteen thousand dollars be, and is hereby appropriated for the purpose of laying a telegraphic cable, under the direction of the Chief Signal Officer of the Army, from the main land of Rhode Island to Block Island, Rhode Island. Telegraph cable between Block Island and the main land, Rhode Island.

Approved January 14, 1880.

ACT OF JUNE 16, 1880.

21 Stat., 206. AN ACT making appropriations for the sundry civil expenses of the government for the fiscal year ending June thirtieth, eighteen hundred and eighty-one, and for other purposes.

* * * * *

Telegraphing reports. *Signal Service.*—Observation and report of storms: For the expenses of the observation and report of storms by telegraph and signal for the benefit of commerce and agriculture throughout the United States; for manufacture, purchase, and repair of meteorological and other necessary instruments; for telegraphing reports; for expenses of storm-signals announcing the probable approach and force of storms; for continuing the establishment and connection of stations at life-saving stations and light-houses; for instrument-shelters; for hire, furniture, and expenses of offices maintained for public use in cities and ports receiving reports; for river reports; for maps and bulletins to be displayed in chambers of commerce and boards of trade rooms, and for distribution; for books, periodicals, newspapers, and stationery; and for incidental expenses not otherwise provided for, three hundred and seventy-five thousand dollars. There shall be added to the Signal Corps fifty privates; and from and after the passage of this act the Chief Signal Officer shall have the rank and pay of a brigadier-general.

Chief Signal Officer to have rank and pay of a brigadier-general.

Construction, &c., of military telegraph lines. *Construction, maintenance, and repair of military telegraph lines.*—For the construction and continuing the construction, maintenance, and use of military telegraph lines on the Indian and Mexican frontiers and in the Northwest, and for the connection of military posts and stations, seventy-five thousand dollars.

Rev. Stat., p. 36. SEC. 223. The Secretary of War is authorized to establish signal-stations at light-houses and at such of the life-saving stations on the lake or sea-coast as may be suitably located for that purpose, and to connect the same with such points as may be necessary for the proper discharge of the signal-service by means of a suitable telegraph-line in cases where no lines are in operation, to be constructed, maintained, and worked under the direction of the Chief Signal-Officer of the Army; or the Secretary of War and the Secretary of the Treasury; and the use of the life-saving stations as signal-stations shall be subject to such regulations as may be agreed upon by said officials.

APPENDIX K.

Articles of consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, entered into January 24, 1860.

NEW YORK, January 24, 1860.

To the honorable the SECRETARY OF THE INTERIOR,
Washington, D. C.:

The annexed is a copy of the articles of union and consolidation between the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, forming the Union Pacific Railway Company.

This copy is herewith delivered to you and deposited and filed in the Department of the Interior, pursuant to section 16 of the act of Congress of July 1, 1862, therein referred to, and section 16 of the act amendatory thereof, approved July 2, 1864.

I have the honor to be, with great regard, your obedient servant,

SIDNEY DILLON,
President.

Articles of union and consolidation between the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, forming the Union Pacific Railway Company.

Whereas the Union Pacific Railroad Company, a corporation duly organized and existing under the act of Congress of July 1, 1862, entitled "An act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes," and the act of Congress of July 2, 1864, and various other acts amendatory of the foregoing, owns a line of railroad and telegraph extending from the Missouri River to Ogden, in the Territory of Utah, a distance of 1,042 miles;

And whereas the Kansas Pacific Railway Company, described in the said act of Congress of July 1, 1862, as the Leavenworth, Pawnee and Western Railroad Company, the name whereof was afterward changed to that of the Union Pacific Railway Company, Eastern Division, and again subsequently changed to the Kansas Pacific Railway Company, is a corporation which is entitled to participate in the benefits of the said act of Congress of July 1, 1862 and of July 2, 1864, and the various acts amendatory thereof and relating thereto;

And whereas the said Kansas Pacific Railway Company owns and operates, as a branch of the Union Pacific Railroad, a railroad and telegraph line from a point connecting with the Missouri Pacific Railroad in Kansas City, in Missouri, thence from the Missouri River, at the mouth of the Kansas River, on the south side thereof, with a spur from Wyandotte, in the State of Kansas, being from the east State line of Kansas to Denver, 639 miles in length, with a branch from a point on the main line near Lawrence to Leavenworth, 34 miles in length, in said State of Kansas, connecting at Denver with the Denver Pacific Railway, and is entitled to extend said railroad to the western boundary of the former Territory of Kansas, to locate and construct branches of said railroad in the counties of the former Territory of Kansas, adjacent to the line of said railroad, as then located and defined by law;

And whereas the Denver Pacific Railway and Telegraph Company, under and by virtue of the said acts of Congress, and of an act of Congress approved March 3, 1869, entitled, "An act to authorize the transfer of lands granted to the Union Pacific Railway Company, Eastern Division, between Denver and the point of connection with the Union Pacific Railroad, to the Denver Pacific Railway and Telegraph Company, and to expedite the completion of railroads to Denver, in the territory of Colorado"; and of an act of Congress approved June 20, 1874, which, among other things, enacts that for all the purposes of the said act of July 1, 1862, and of the acts amendatory thereof, "The Denver Pacific Railway and Telegraph Company shall be deemed and taken to be a part and extension of the road of the Kansas Pacific Railroad to the point of junction thereof with the road of the Union Pacific Railroad Company at Cheyenne, as provided in the act of March 3, 1869," whereby and by force whereof the said Denver Pacific Railway and Telegraph Company is likewise entitled to participate in the benefits of the aforementioned acts of Congress of July 1, 1862, and July 2, 1864, and the various acts amendatory thereof and supplemental thereto and relating to the Pacific system of railroads; all of which, whether particularly herein described or not, are, for greater certainty in this behalf, referred to and made part hereof;

And whereas the said Denver Pacific Railway and Telegraph Company owns a line of road one hundred and six miles in length, extending from Denver, where it connects with the said Kansas Pacific Railway, to Cheyenne, where it connects with the Union Pacific Railroad;

And whereas in the aforesaid legislation of Congress applicable to the above mentioned three railroad companies it is provided that they may unite and consolidate their respective organizations;

And whereas each of the said above mentioned three companies, by corporate action duly and severally had, have resolved, pursuant to the authority in that behalf vested in them by law, to unite and consolidate their respective organizations into one company, and have severally agreed to and with each other upon the terms of such union and consolidation, being the terms herein embodied and expressed:

Now this agreement of union and consolidation, made this the 24th day of January, A. D. 1880, between the said Union Pacific Railroad Company, party of the first part, the said Kansas Pacific Railway Company, party of the second part, and the said Denver Pacific Railway and Telegraph Company, party of the third part, witnesseth:

That the said parties have respectively agreed and do hereby severally agree to and with each other upon the following articles of union and consolidation of their respective organizations into one company, viz:

ARTICLE I. The said Union Pacific Railroad Company, the said Kansas Pacific Railway Company, and the said Denver Pacific Railway and Telegraph Company, in consideration of the premises, do hereby severally agree to and with each other to unite and consolidate, and do hereby unite, form, and consolidate their respective organizations, properties, and companies into one consolidated company, which shall succeed to, possess, and be entitled to receive from the Government of the United States all and singular the grants, benefits, immunities, guaranties, acts, and things to be done and performed, and be subject to the same terms, conditions, restrictions, and requirements which the aforesaid three companies, respectively, at the date of this consolidation, are or may be entitled or subject to under the acts of Congress in that behalf, in place and substitution of said constituent companies so consolidated, respectively; and the said consolidated company assumes to and for itself all of the provisions of said acts of Congress, so far as applicable, relating or in any manner appertaining to said constituent companies, or either of them, including the power to sue and be sued in all courts of law and equity within the United States, whether Federal or State, and the right of corporations organized under a law of the United States to remove causes from State to Federal courts; and all of the provisions of the aforementioned acts of Congress and each of them, so far as in their nature applicable to the company hereby formed, shall apply thereto; it being the intent of the parties hereto and of these articles of union and consolidation to organize the company hereby formed under the said acts of Congress, and to make the said acts of Congress the charter or constituent acts of this company as fully as if the same were incorporated herein at large.

ART. II. The name of the said consolidated company hereby formed shall be "The Union Pacific Railway Company."

ART. III. The capital stock of the said Union Pacific Railway Company shall be fifty millions, seven hundred and sixty-two thousand, three hundred (\$50,762,300) dollars (being the total aggregate amount of the outstanding stock of the three constituent companies), which shall be divided into shares of one hundred dollars each; and it shall be issued in lieu of the stock of the said constituent companies on the surrender thereof for that purpose by the respective holders thereof. Every stockholder in the Denver Pacific Railway and Telegraph Company and in the Union Pacific Railroad Company shall receive in place of every share of one hundred dollars surrendered a share of one hundred dollars in the new company; and every stockholder in the Kansas Pacific Railway Company, the shares in which are only fifty (\$50) dollars each, shall receive in place of every two shares of the stock at the time held by such stockholder in such company a share of the capital stock of the new corporation, upon surrendering to the new corporation the certificates of stock held by such stockholder.

ART. IV. The said new corporation shall, without unnecessary delay, issue certificates of stock, in such form as may by the board of directors be deemed advisable; and such board shall provide and adopt such rules and regulations as may be necessary and proper for the issuing and transfer of shares of stock of the said new corporation.

ART. V. The directors of the said Union Pacific Railway Company, to be elected by the stockholders at the annual meetings herein provided for, shall be fifteen in number, each of whom must be the *bona-fide* owner of at least fifty shares of stock in the consolidated company. Such directors shall be chosen annually by a majority of the votes of the stockholders voting in person or by proxy at such election. And they shall continue to be directors until others are elected and qualified in their places. No person shall be a director unless he shall be qualified to vote for directors at the election at which he shall be chosen; and vacancies in the board of directors may be filled by the remaining directors at any regular meeting of the board. The directors

of the said company shall annually, as soon as may be after their election, elect from their own number a president and vice-president, and shall also elect a treasurer and secretary.

ART. VI. The following named persons shall be the first directors of said corporation, viz: Fred. L. Ames, Ezra H. Baker, Elisha Atkins, F. Gordon Dexter, Sidney Dillon, Russell Sage, Jay Gould, Solon Humphreys, David Dows, William L. Scott, Silas H. H. Clark, Thomas T. Eckert, John Sharp, Grenville M. Dodge, Carlos S. Greeley. The following named persons shall be the first officers of the said corporation, viz: President, Sidney Dillon; vice-president, Elisha Atkins; treasurer and secretary, Henry McFarland. The said directors and officers shall continue in office until their successors are chosen as provided in these articles.

ART. VII. Until otherwise duly provided, the annual meetings of the stockholders of the Union Pacific Railway Company shall be held at the company's office in the city of New York on the first Wednesday following the fourth day of March in each year, between the hours of 10 o'clock a. m. and 4 o'clock p. m. of said day. Notice of such meetings shall be given as may be prescribed by the by-laws. These provisions may be changed by the stockholders of the consolidated company at any annual meeting of the said stockholders.

ART. VIII. The parties hereto of the first, and second, and third parts hereby assign, transfer, set over, and convey unto the said Union Pacific Railway Company, the consolidated corporation hereby formed, all the rights, privileges, exemptions, and franchises of each of said companies, parties hereto, and all the property, real, personal, and mixed, and all choses in action, debts on whatever account of, owing, or belonging to either of said companies, and all claims, demands, property, rights of way, leases, leasehold interests, branches, iron rails, rolling stock, tools and implements, and property of every description, name, and nature belonging to either of the said companies, with the appurtenances, to be held, owned, and controlled by the said consolidated corporation, its successors and assigns, as fully and completely to all intents and purposes as the respective parties hereto do, or can now own, hold, use, enjoy, or control the same; and the parties hereto agree to execute and deliver to said consolidated corporation instruments of transfer, or assignments, or other instruments proper or necessary to carry out the covenants, conditions, and provisions of this agreement. This assignment, transfer, sale, and conveyance is made to the said consolidated corporation subject to all liens, charges, and equities pertaining thereto.

ART. IX. Nothing in this agreement contained shall affect or prejudice any right otherwise existing of the consolidated company to make such further increase of stock or bonds as said consolidated company may by law be entitled to make, or restrict the amount of stock or bonds which such consolidated company is by law authorized to issue or make. Nor shall anything herein contained affect or impair the right to issue all unissued bonds under the Kansas Pacific consolidated mortgage of date May 1, 1879, wherein Jay Gould and Russell Sage are trustees, but such unissued bonds may, notwithstanding this consolidation, be issued in the same manner, and with the same effect in all respects as if these articles had not been adopted and executed.

And it is expressly agreed that the stockholders of the consolidated company shall have all the powers which would have been possessed by the stockholders of each constituent company if this consolidation had not been effected, to ratify, approve, and carry out any contracts made by either constituent company, and requiring the ratification or approval of its stockholders.

The power of the Union Pacific Railroad Company to issue all unissued bonds under the mortgage of July 1, 1879, wherein the Union Trust Company is trustee is fully and completely reserved.

ART. X. The new company hereby formed does not herein assume any separate or individual liability for the outstanding debts, obligations, and liabilities of the respective constituent companies, whose several and separate existence as to third parties shall, as respects such debts, obligations, and liabilities of every kind and nature still continue, notwithstanding these articles of union and consolidation. But nothing herein contained shall prevent any valid debt, obligation, or liability of either constituent company from being enforced against the property of the proper constituent company, which by force of these articles becomes the property of the consolidated company. The corporate existence of the respective constituent companies shall not absolutely cease, *eo instanti*, on the consummation of the union and consolidation herein provided for, but shall remain and continue so far as necessary to carry out the intent and purpose hereof.

ART. XI. These articles of consolidation shall go into effect and the consolidated company hereby formed shall come into existence upon the day on which a copy hereof is filed in the Department of the Interior, as provided in the legislation of Congress in that behalf.

ART. XII. The existing by-laws of the Union Pacific Railroad Company are hereby provisionally adopted and shall apply to the company hereby formed until duly changed or repealed.

ART. XIII. All books, vouchers, records, instruments of title, cash, evidences of debt, contracts, and documents pertaining to the business or property of the said three companies, parties hereto, shall, without delay, be delivered to the proper officers of the consolidated company, and the said books, records, and papers shall be deemed and taken, as far as necessary, as the records and books of said consolidated company; and said books, records, vouchers, and papers shall be subject to the proper examination and inspection of all persons interested therein.

ART. XIV. These articles may be amended and modified from time to time, and in such manner as the holders of two-thirds of the stock of the consolidated company may direct or approve.

ART. XV. This agreement shall be executed on the part of the respective parties hereto, by the proper officers, and under the corporate seals of said companies.

In witness whereof, the said parties have caused their respective corporate seals to be hereunto affixed and the same to be attested by their respective presidents and secretaries, this the 24th day of January, A. D. 1880.

[SEAL.]

THE UNION PACIFIC RAILROAD COMPANY,
By SIDNEY DILLON, *President*.

Attest:

HENRY MCFARLAND, *Secretary*.

[SEAL.]

THE KANSAS PACIFIC RAILWAY COMPANY,
By SIDNEY DILLON, *President*.

Attest:

A. H. CALEF, *Secretary*.

[SEAL.]

THE DENVER PACIFIC RAILWAY & TELEGRAPH CO.,
By D. M. EDGERTON, *President*.

Attest:

D. H. MOFFATT, JR., *Secretary*.

The Union Pacific Railway Company has signified, and hereby signifies, its assent to and acceptance of the foregoing articles of union and consolidation, January 24, 1880.

[SEAL.]

THE UNION PACIFIC RAILWAY COMPANY,
By SIDNEY DILLON, *President*.

STATE OF KANSAS,

Office of Secretary of State, ss:

I, James Smith, secretary of state of the State of Kansas, do hereby certify that the following is a true and correct copy of the copy of the articles of union and consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and Denver Pacific Railway and Telegraph Company into the Union Pacific Railway Company, and a true and correct copy of the copy of the ratification and approval of the stockholders of the Kansas Pacific Railway Company; and a true and correct copy of the original certificate of A. H. Calef, secretary Kansas Pacific Railway Company, filed in this office April 30, 1880.

(Copy B.)

Stockholders' ratification and approval.

Know all men by these presents, that we, the undersigned persons and parties holding and representing the shares of the capital stock of the Kansas Pacific Railway Company, now issued and outstanding, to the extent set forth opposite our respective names, have ratified and approved, and by these presents do ratify and approve the articles of union and consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, into the Union Pacific Railway Company, dated the 24th day of January, A. D. 1880, and hereby referred to for greater certainty, and made part hereof.

Names.	Number of shares.	Residence.
Jay Gould	79,414	New York.
Sidney Dillon	6,118	5 W. 37th street, N. Y.
C. S. Greeley	1,126	Saint Louis, Mo.
G. M. Dodge	119	Council Bluffs, Iowa.
F. Gordon Dexter	2,514	Boston, Mass.
F. Gordon Dexter, trustee	43	Do.
E. H. Baker	548	Do.
Frederick L. Ames	4,035	North Easton, Mass.
C. J. Morrill, by E. H. Baker	548	Boston, Mass.
James M. Ham, treasurer	3,830	New York.
A. G. P. Segur	1,000	Brooklyn, N. Y.
Russell Sage	9,977	New York.
C. E. Silkworth	1,000	Do.
F. L. Mather	900	Do.
Myers, Rutherford & Co	9,015	Do.
James Buell, by Russell Sage	1,078	Do.
Prince & Whitely	400	Do.
Milla, Robeson & Smith	10	Do.
Robin & Robinson	500	Do.
L. D. Alexander	300	Do.
Field & James	300	Do.
A. M. Kidder & Co	200	Do.
Ham & Munroe	829	Do.
Edwin H. Perkins Jr., by Russell Sage	718	Do.
Woerishoffer & Co	1,300	Do.
John S. Tilney & Co	300	Do.
Edward Sweet & Co	200	Do.
Groot & Chapman	1,000	Do.
F. W. Gilley Jr. & Co	500	Do.
L. Chase & Co	400	Do.
Hewson, Kilbreth & Co	1,406	Do.
Iselin & Barker	2,000	Do.
George W. Perkins	718	Do.
James F. Woodward	718	Do.
Jacob Berry	1,300	Do.
Grant & Co	500	Do.
V. B. King	1,400	Do.
R. P. Learned & Co	300	Do.
E. C. Homans & Co	200	Do.
Archibald Turner & Co	200	Do.
P. W. Gallaudet	300	Do.
Putnam & Earle	400	Do.
H. L. Horton & Co	200	Do.
Chase & Higginson	15,607	Do.
William Alexander Smith	2,000	Do.
William Alexander Smith & Co., attorney	600	Do.
Do	800	Do.
Addison Cammack	201	Do.

THE STATE OF NEW YORK,
City and County of New York:

I, A. H. Calef, secretary of the Kansas Pacific Railway Company, do hereby certify and state that, annexed hereto is a true copy of the articles of union and consolidation of the Union Pacific, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company into the Union Pacific Railway Company. And I further certify and state that the said articles of union and consolidation were ratified and approved in writing before said articles took effect, by stockholders holding and representing more than two-thirds of all the stock of the said Kansas Pacific Railway Company, a copy of which ratification and approval is hereto annexed, marked B, and made part of this certificate, and I further certify and state that up to the date of making this certificate that stockholders holding 199,084 shares of stock of the said Kansas Pacific Railway Company, have, pursuant to said articles of union and consolidation, surrendered their stock in said Kansas Pacific Railway Company, and exchanged the same for and received in lieu thereof the stock of said Union Pacific Railway Company.

In witness whereof I have hereunto set my hand and the seal of the said Kansas Pacific Railway Company, this 26th day of April, A. D. 1880.

[SEAL.] (Signed)

A. H. CALEF,
Secretary Kansas Pacific Railway Company.

In testimony whereof I have hereunto subscribed my name and affixed my official seal. Done at Topeka this 1st day of May, A. D. 1880,

[SEAL.] (Signed)

JAMES SMITH,
Secretary of State.

Proceedings of meeting of stockholders of the Union Pacific Railroad Company, held August 18, 1880, at Omaha, Neb., ratifying the articles of union and consolidation.

At a meeting of the stockholders of the Union Pacific Railroad Company, held at the office of said company in the city of Omaha, Nebr., on the 18th day of August, 1880, between the hours of 10 o'clock a. m. and 4 o'clock p. m., of said day, said meeting being held in pursuance of the call therefor and notices thereof given, as appearing by the following certificate of Henry McFarland, secretary of the said company, in words and figures as follows:

[Copy.]

I Henry McFarland, hereby certify that I am the secretary of the Union Pacific Railroad Company, and as such secretary I have charge of the records and files of said company; that it appears by said records that at a meeting of the executive committee of the board of directors of the Union Pacific Railroad Company, held in New York on March 10, 1880, at which were present Messrs. Dillon, Atkins, Baker, Dexter, and Ames, it was, on motion of Mr. Baker, seconded by Mr. Atkins,

"*Voted*, That the president be authorized to call a special meeting of the stockholders of the Union Pacific Railroad Company, at such time and place and in such manner as counsel may advise, to take action in respect to the articles of consolidation and union, with a view to a formal ratification and record thereof in the State of Nebraska and elsewhere."

I further certify that, at a meeting of the directors of the Union Pacific Railroad Company, held in Boston on March 5, 1879, it was, on motion of Mr. Sage,

"*Resolved*, That while the board of directors is not in session the full power thereof under the charter and by-laws be, and it hereby is, conferred upon the executive committee."

I further certify that it appears by said records that the following communication was received and placed on the files of the company, to wit:

"To SIDNEY DILLON,

"*President of the Union Pacific Railroad Company* :

"The undersigned owners of the number of shares of stock in said company set opposite respective names, in the aggregate amounting to more than one-fourth of all the capital stock, hereby make application to you to call a special meeting of the stockholders of the said company, to be held at the office of the company in Omaha, on the 18th day of August, 1880, for the purpose of determining by vote of the corporation its assent to or dissent from the articles of union and consolidation between said company, the Kansas Pacific Railway Company and the Denver Pacific Railway and Telegraph Company, of date January 24, 1880.

"The undersigned ask that the notice of such special meeting be given and published as required by law on that behalf, stating the object of the meeting.

"The separate assent of more than two-thirds of the stock in the Union Pacific Railroad Company having been given to the said articles of union and consolidation, the undersigned deem it proper that a meeting be called, that such assent may be manifested by a recorded vote of the stockholders at a meeting of the company to be held for that purpose.

Names of stockholder.	Number of shares.	Amount.
Sidney Dillon	27, 150	\$2, 715, 000
Sidney Dillon, trustee	12, 000	1, 200, 000
Hannah Dillon	2, 000	200, 000
E. H. Baker, for self and others	8, 000	800, 000
Fred. L. Ames, executor	87, 515	3, 751, 500
Fred. L. Ames	1, 357	135, 700
Helen A. Ames, by F. L. Ames, attorney	1, 000	100, 000
Oliver Ames and Sons	140	14, 000
W. E. Connor	21, 400	2, 140, 000
A. G. P. Segur	6, 305	630, 500
E. A. Quinn	1, 500	150, 000
C. E. Silkworth	3, 300	330, 000
F. L. Mathes, jr	2, 500	250, 000
William D. Segur	1, 000	100, 000
H. Cumiskey	1, 000	100, 000

I further certify that in pursuance of said resolution of the executive committee, passed on March 10, 1880, and in pursuance of the application in writing of stockholders owning in the aggregate more than one-fourth of all the capital stock of the company, the following notice, to wit:

PUBLIC NOTICE.

Whereas stockholders owning more than one-fourth part of the capital stock of the Union Pacific Railroad Company have duly applied in writing to the undersigned, the president of said company, to call a special meeting of the stockholders of said company, for the purpose of determining, by vote of the corporation, its assent to or dissent from the articles of union and consolidation between said company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, of date January 24, 1880—said application stating that the separate assent of more than two-thirds of the stock in the Union Pacific Railroad Company has been given to said articles of union and consolidation—it is deemed proper that a special meeting of the stockholders be called, that such assent be manifested by a recorded vote of the stockholders, at a meeting of the company to be held for that purpose:

Now, therefore, pursuant to said application, I, Sidney Dillon, president of the said Union Pacific Railroad Company, do, by order of the board of directors, hereby call a special meeting of the stockholders of said company, to be held at the office of the Union Pacific Railroad Company, in the city of Omaha, Nebraska, on the 18th day of August, A. D. 1880, between the hours of ten o'clock a. m., and four o'clock, p. m., or said day, for the purpose of determining, by vote of said corporation, its assent to or dissent from the said articles of union and consolidation, dated January 24, 1880, a copy of which has been duly filed with the Secretary of the Interior, and the original of which is on file, and can be seen at the company's office, 78 Broadway, New York.

Given under my hand this 4th day of May, A. D. 1880.

SIDNEY DILLON,

President of the Union Pacific Railroad Company.

HENRY MCFARLAND, *Secretary.*

N. B.—Nearly all stockholders having already assented to the consolidation, the purpose of the proposed meeting is merely to have that assent take the form of a recorded vote.

was sent on May 15, 1880, by mail, postage prepaid, to all the stockholders in the Union Pacific Railroad Company of record at the closing of the stock-books on January 24, 1880, and that the same notice was published in the Boston Daily Advertiser, a newspaper published in the city of Boston, Mass., daily, excepting the intervening Sundays, from and commencing with July 9 to August 12, inclusive, constituting thirty publications of said notice in said paper; and that the same notice was published in the New York Tribune, a newspaper published in the city of New York, daily, from and commencing with July 10 to August 9, inclusive, constituting thirty publications of said notice in said paper.

The sworn statements of the foremen or publishers of those newspapers are annexed.

And the same notice was also published in a newspaper published at Omaha, Nebraska (Omaha being the city in Nebraska in which said corporation has its principal office of business), called the Omaha Weekly Herald, as follows, viz: From and commencing with the 21st day of May, 1880, to the 8th day of July, A. D. 1880, inclusive, being more than six successive weeks prior to August 18, as shown by the affidavit of the book-keeper of said newspaper.

And the same notice was by me also addressed by name, and on May 18, 1880, sent by mail, postage prepaid, to each stockholder of record, as shown by the stock-books in the Union Pacific Railway Company, at Boston, at the close of business on May 4, 1880, and also in like manner to all stockholders in said company of record on the stock-books in New York, at the close of business on May 5, 1880, to whom, as stockholders in the Union Pacific Railroad Company, notice had not been sent on May 5, 1880, as hereinbefore stated.

HENRY MCFARLAND, *SECRETARY*

Secretary Union Pacific Railroad Company.

STATE OF MASSACHUSETTS,
County of Suffolk, ss:

Subscribed and sworn to before me.
[SEAL.]

JAMES G. HARRIS,
Notary Public.

PUBLIC NOTICE.

Whereas stockholders owning more than one-fourth part of the capital stock of the Union Pacific Railroad Company have duly applied in writing to the undersigned, the president of said company, to call a special meeting of the stockholders of said company, for the purpose of determining by vote of the corporation its assent to or dissent from the articles of union and consolidation between said company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, of date January 24, 1880—said application stating that the separate assent of more than two-thirds of the stock in the Union Pacific Railroad Company has been given to said articles of union and consolidation—it is deemed proper that a special meeting of the stockholders be called, that such assent be manifested by a recorded vote of the stockholders, at a meeting of the company to be held for that purpose:

Now, therefore, pursuant to said application, I, Sidney Dillon, president of the said Union Pacific Railroad Company, do, by order of the board of directors, hereby call a special meeting of the stockholders of said company, to be held at the office of the Union Pacific Railroad Company, in the city of Omaha, Nebr., on the 18th day of August, A. D. 1880, between the hours of 10 o'clock a. m. and 4 o'clock p. m. of said day, for the purpose of determining by vote of the said corporation its assent to or dissent from the said articles of union and consolidation, dated January 24th, 1880, a copy of which has been duly filed with the Secretary of the Interior, and the original of which is on file and can be seen at the company's office, 78 Broadway, New York.

Given under my hand this 4th day of May, A. D. 1880.

SIDNEY DILLON,

President of the Union Pacific Railroad Company.

HENRY MCFARLAND,
Secretary.

N. B.—Nearly all stockholders having already assented to the consolidation, the purpose of the proposed meeting is merely to have that assent take the form of a recorded vote.

Proofs of the due publication of the notices in the foregoing certificate referred to and thereto annexed.

STATE OF NEW YORK,

City and County of New York, ss :

W. P. Thompson, being duly sworn, saith that he is foreman in the office of the New York Daily Tribune, a newspaper printed in the city of New York; that the advertisement hereto annexed has been regularly published in the said New York Daily Tribune thirty times successively, commencing on the 10th day of July, 1880.

W. P. THOMPSON.

Sworn to before me, this 9th day of August, 1880.

GORDON L. FORD,

Notary Public Kings Co., N. Y. (and N. Y. Co).

STATE OF NEBRASKA,

Douglas County, ss :

W. H. Remington, being duly sworn, deposes and says that he is book-keeper of the Omaha Weekly Herald, a newspaper printed at Omaha, in the said county of Douglas; that the printed notice hereto attached was published in the said weekly newspaper six consecutive weeks next after and including the 21st day of May, A. D. 1880. The said newspaper was, during that time, in general circulation in the county of Douglas and State of Nebraska.

(Signed)

W. H. REMINGTON.

Subscribed in my presence, and sworn to before me, this 8th day of July, 1880.

[SEAL.]

GEO. H. HOGGS,

Notary Public.

Printer's fees, \$14; affidavit, 25 cents—total, \$14.25.

STATE OF MASSACHUSETTS,

County of Suffolk, ss :

On the 13th day of August, A. D. 1880, personally appeared before the undersigned, a justice of the peace within and for said county and State, E. F. Waters, treasurer, publisher of the Boston Daily Advertiser, a daily newspaper published at Boston, county of Suffolk, in the State of Massachusetts, and who, being duly sworn, states on oath that the "Notice special meeting stockholders Union Pacific Railroad Co." a true copy of which is hereto annexed, was published in said newspaper, in its issue of July 9, 1880, and thirty successive days in all, not including Sundays.

BOSTON DAILY ADVERTISER,

E. F. WATERS, *Treasurer.*

Subscribed and sworn to before me, this 13th day of August, 1880.

URIAH A. POLLARD,

Justice of the Peace.

The following proceedings were had :

The stockholders assembled, at the time and place above mentioned, and organized by electing Joseph W. Gannett chairman, and A. J. Poppleton secretary, of said meeting.

The secretary thereupon explained the object of said meeting to be to determine, by a vote of the stockholders of the corporation, its assent to or dissent from the articles of union and consolidation dated January 24, 1880, a copy of which has been duly filed with the Secretary of the Interior, and the original of which was presented to the stockholders assembled as aforesaid.

On motion of Mr. Poppleton, duly seconded, it was

Voted, That the chairman, Mr. Gannett, and Mr. Vis be appointed a committee to examine and report to the meeting the names of the stockholders present in person or by proxy, and the number of shares of stock held by them respectively in the Union Pacific Railroad Company, as shown on the books of said company, on the 24th day of January, 1880, and who are entitled to vote at this meeting, which committee performed that duty and reported the following shares of such stock as being represented, and the same were of record upon the stock-books of the Union Pacific Railroad Company on the said 24th day of January, 1880, to wit :

Names of shareholders present, in person or by proxy, and number of shares of stock in the Union Pacific Railroad Company held by them, as shown on the books of the company, on the 24th day of January, 1880, and which have not been exchanged for shares in the Union Pacific Railway Company.

Names.	Proxies.	Number of shares.
Sidney Dillon	J. W. Gannett.....	50
Estate of Oliver Ames, by Fred. L. Ames, executor	do	37, 115
Fred. L. Ames	do	1, 337
Oliver Ames & Sons	J. W. Gannett (33,612) ..	140
First National Bank of Easton, as collateral	do	500
		39, 162

On motion, the report of the committee was received and adopted.

On motion of Mr. Poppleton, duly seconded, it was

Resolved, That the said articles of union and consolidation, dated January 24, 1880, the original of which is here presented, and a copy of which is on file with the Secretary of the Interior, as above stated, whereby the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, have severally agreed to unite and consolidate into a new company called the Union Pacific Railway Company, be and the same are hereby ratified and approved, which said resolution was adopted by a vote of the following shares of stock in the said Union Pacific Railroad Company, standing on the books of said company on the 24th day of January, 1880, to wit :

Names.	Proxies.	Number of shares.
Sidney Dillon	J. W. Gannett ..	50
Estate of Oliver Ames, by Fred. L. Ames, executor	do	37, 115
Fred. L. Ames	do	1, 337
Oliver Ames & Sons	do	140
First National Bank of Easton, as collateral	do	500
		39, 162

There were no votes cast against the said resolution, and the said resolution was thereupon declared adopted, and ordered to be recorded.

On motion of Mr. Poppleton, duly seconded, it was

Voted, That Mr. Gannett and Mr. Vis be appointed a committee to examine and report to the meeting the names of shareholders and number of shares of stock in the said Union Pacific Railroad Company, which had been exchanged between the 24th day of January, 1880, and the 9th day of August, 1880, into the stock issued by the Union Pacific Railway Company, and which were entitled to vote at this meeting.

Said committee reported the following shares of such stock were represented and entitled to vote at this meeting, to wit :

Names of shareholders and number of shares of stock in the Union Pacific Railroad Company which have been exchanged between the 24th day of January, 1880, and the 9th day August, 1880, into the stock issued by the Union Pacific Railway Company, entitled to vote at this meeting.

Names.	Proxies.	Number of shares.
Helen A. Ames	A. J. Poppleton	1,000
Fred. L. Ames	do	1,813
Oakes A. Ames	do	100
Oliver Ames and Oliver Ames as collateral	do	600
Elisha Atkins	do	500
Do	do	2,165
E. Atkins & Co	do	500
F. Gordon Dexter	do	3,544
S. Hooper & Co	do	2,164
		8,873
Esra H. Baker	do	2,330
Ether H. Baker	do	1,300
Rogers L. Barstow and Esra H. Baker, trustees	do	1,200
John R. Brewer, executor	do	25
Do	do	925
		950
George M. Barnard and Samuel Barnard, trustees	do	100
Joshua Ballard	do	250
Samuel Carr	do	100
Joseph H. Converse	do	300
F. Gordon Dexter, trustee	do	1,278
Faneull Hall National Bank	do	2,315
Do	do	100
E. W. Gilmore	do	800
Jackson & Curtis	do	250
Helena M. Kent	do	1,300
George W. Kennedy	do	300
H. A. Lothrop	do	203
H. A. Lothrop & Co	do	220
		423
E. Rollins Morse & Brother	do	275
I. E. Morrison	do	200
Mechanics' National Bank	do	300
C. J. Morrill	do	1,906
John C. Sharp	do	100
Mrs. Helen Sharp	do	400
		500
Second National Bank of Boston	do	1,000
Thomas M. Stetson	do	780
Walker & Brother	do	600
H. C. Wainwright & Co	do	250
The Tremont National Bank	do	3,285
Tower, Giddings & Co	do	100
Putnam & Earle	do	500
Myers, Rutherford & Co	do	4,585
Martin & Runyon	do	1,450
H. B. Hollins & Co	do	100
James M. Ham, treasurer	do	7,140
W. S. Gurney, jr., & Co	do	4,000
Jay Gould	do	1,630
Clark, Dodge & Co	do	1,100
O. N. Bogart & Co	do	900
John Bloodgood & Co	do	400
A. H. Brown	do	1,050
Blake, Bros & Co	do	2,780
Bound & Co	do	1,314
Belden, Bennett & Co	do	5,320
Clooson & Hays	do	2,240
W. E. Connor	do	7,000
James R. Cowing	do	500
R. L. Cutting, jr., & Co	do	300
David Dows	do	1,000
Hannah Dillon	do	2,000
Sidney Dillon, trustee	do	12,100
Do	do	34,399
James H. Moore	do	425
F. W. Gilley, jr., & Co	do	6,110
Gregory & Ballou	do	1,100
Hallgarten & Co	do	1,400
Harriott & Noyes	do	400
W. T. Hatch & Sons	do	1,750
Edward King, president	do	5,000
Do	do	8
		5,008
Horace Manual & Co	do	100
F. L. Mathes	do	18,100
G. P. Morosini	do	20,041
Morton, Bliss & Co	do	1,802
E. A. Quinn	do	1,000
David Richmond	do	3,803

Names of shareholders and number of shares of stock, &c.—Continued.

Names.	Proxies.	Number of shares.
Russell Sage	A. J. Poppleton	15, 268
A. G. P. Segur	do	9, 405
Vermilye & Co	do	8, 281
Imac Thacher	do	2, 514
Moe S. Lott	do	4, 400
Aaron Hobart, jr	do	1, 033
E. Emmett	do	1, 000
John J. Cisco & Son	do	400
G. M. Dodge	do	1, 308
Domiaick & Dickerman	do	200
Charles Head & Co	do	675
William Heath & Co	do	600
Brayton Ives & Co	do	1, 000
De Neuville & Co	do	845
C. E. Silkworth	do	2, 000
Scott & Leavitt	do	1, 800
Trask & Francis	do	1, 184
Whitehouse & Co	do	400
Total		240, 465

On motion of Mr. Poppleton, duly seconded, it was

Resolved, That the articles of union and consolidation, whereby the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company were united and consolidated into the Union Pacific Railway Company, of date January 24, 1880, the original whereof is here presented, and a copy whereof is on file with the Secretary of the Interior, be and the same are hereby ratified and approved.

The said resolution was passed by a vote of the following shares:

Names of shareholders and number of shares of stock in the Union Pacific Railroad Company which have been exchanged between the 24th day of January, 1880, and the 9th day of August, 1880, into the stock issued by the Union Pacific Railway Company entitled to vote at this meeting.

Names.	Proxies.	Number of shares.
Helen A. Ames	A. J. Poppleton	1, 000
Fred. L. Ames	do	1, 813
Oakes A. Ames	do	100
Oliver Ames and Oliver Ames, as collateral	do	608
Elisha Atkins	do	500
Do	do	2, 185
E. Atkins & Co.	do	500
F. Gordon Dexter	do	3, 544
S. Hooper & Co	do	2, 164
		8, 873
Esra H. Baker	do	2, 330
Eather H. Baker	do	1, 300
Rogers L. Barstow and Esra H. Baker, trustees	do	1, 300
John B. Brewer, executor	do	25
Do	do	925
		950
George M. Barnard and Samuel Barnard, trustees	do	100
Joshua Ballard	do	250
Samuel Carr	do	100
Joseph H. Converse	do	300
F. Gordon Dexter, trustee	do	1, 278
Faneuil Hall National Bank	do	2, 315
Do	do	180
E. W. Gilmore	do	800
Jackson & Curtis	do	250
Helen M. Kent	do	1, 300
George W. Kennedy	do	208
H. A. Lothrop	do	220
H. A. Lothrop & Co.	do	423
E. Rollins Morse & Brother	do	275
I. E. Morrison	do	200
Mechanics' National Bank	do	200
C. J. Morrill	do	1, 098
John C. Sharp	do	100
Mrs. Helen Sharp	do	400
		500
Second National Bank of Boston	do	1, 000
Thomas M. Stetson	do	780
Walker & Brother	do	600
H. C. Walnwright & Co	do	250

Number of shareholders and number of shares of stock, &c.—Continued.

Names.	Proxies.	Number of shares.
The Tremont National Bank	A. J. Poppleton	3,285
Tower, Giddings & Co	do	170
Putnam & Earle	do	500
Myers, Rutherford & Co	do	4,585½
Marlin & Runyon	do	1,450
H. B. Hollins & Co	do	100
James M. Ham, treasurer	do	7,140
W. S. Gurney, jr., & Co	do	4,000
Jay Gould	do	1,020
Clark, Dodge & Co	do	1,100
O. N. Bogart & Co.	do	900
John Bloodgood & Co.	do	400
A. H. Brown	do	1,050
Blake Brothers & Co	do	2,790
Bond & Co	do	1,314
Belden, Bennett & Co.	do	5,320
Closson & Hays	do	2,240
W. E. Connor	do	7,000
James R. Cowing	do	500
R. L. Cutting, jr., & Co	do	300
David Dows	do	1,000
Hannah Dillon	do	2,000
Sidney Dillon, trustee	do	12,100
Do	do	84,399
James H. Moore	do	425
F. W. Gilley, jr., & Co	do	6,110
Gregory & Ballou	do	1,100
Hallgarten & Co	do	1,400
Harriot & Noyes	do	400
W. T. Hatch & Sons	do	1,750
Edward King, president	do	5,000
Do	do	8
Horace Mannel & Co.	do	5,008
F. L. Mathes	do	100
G. P. Morosini	do	18,100
Morton, Bliss & Co.	do	20,041½
E. A. Quinn	do	1,802
David Richmond	do	1,000
Russell Sage	do	3,803
A. G. P. Segur	do	15,288
Vermilye & Co.	do	9,405
Isaac Thatcher	do	3,261
Moe S. Lott	do	2,514
Aaron Hobart, jr.	do	4,400
E. Emmett	do	1,033
John J. Cisco & Son	do	1,000
G. M. Dodge	do	400
Dominick & Dickerman	do	1,306
Charles Head & Co.	do	300
William Heath & Co.	do	675
Brayton Ives & Co.	do	600
De Neufville & Co	do	1,000
C. E. Silkworth	do	845
Scott & Leavitt	do	2,000
Trask & Francis	do	1,300
Whitehouse & Co.	do	1,184
		400
Total		240,465

There were no votes cast against the said resolution, whereupon the said resolution was declared adopted, and ordered to be entered of record.

On motion of Mr. Poppleton, duly seconded, it was

Resolved, That a copy of the said articles of union and consolidation, together with the proceedings of the meeting ratifying the same, be filed with the Secretary of the Interior, and with the Secretaries of State of the States of Nebraska, Kansas, and Colorado.

On motion of Mr. Poppleton, duly seconded, it was

Resolved, That the board of directors named in the said articles of union and consolidation, or their executive committee, be authorized to execute any and all instruments, and do any and all acts, necessary to effectuate the purposes of this meeting, and carry out said articles of consolidation.

On motion of Mr. Vis, duly seconded, there being no further business, the meeting adjourned *sine die*.

JOSEPH W. GANNETT, *Chairman*.

Attest:

A. J. POPPLETON, *Secretary*.

APPENDIX L.

RECENT DECISIONS OF THE SUPREME COURT OF THE UNITED STATES AFFECTING
RAILROAD COMPANIES; ALSO, OF CIRCUIT COURTS OF THE UNITED STATES.

Supreme Court of the United States, October Term, 1879.

GEORGE W. THOMAS, ALFRED S. PORTER, }
and Nathaniel F. Chew, plaintiffs in error, } No. 169.
vs. }
THE WEST JERSEY RAILROAD COMPANY. }

In error to the circuit court of the United States for the eastern district of Pennsylvania.

1. The powers of a corporation organized under a legislative charter are only such as the statute confers, and the enumeration of them implies the exclusion of all others.
2. A lease by a railroad company of all its road, rolling-stock, and franchises for which no authority is given in its charter is *ultra vires* and void.
3. The ordinary clause in the charter authorizing such a company to contract with other transportation companies for the mutual transfer of goods and passengers over each other's roads confers no authority to lease its road and franchises.
4. The franchises and powers of such a company are in a large measure designed to be exercised for the public good, and this exercise of them is the consideration for granting them. A contract by which the company renders itself incapable of performing its duties to the public, or attempts to absolve itself from its obligation without the consent of the State, violates its charter and is forbidden by public policy. It is, therefore, void.
5. The fact that the legislature, after such a lease was made, passes a statute forbidding the directors of the company, its lessees or agents, from collecting more than a fixed amount of compensation for carrying passengers and freight, is not a ratification of the lease or an acknowledgment of its validity.
6. Where a lease of this kind for twenty years was made, and the lessors resumed possession at the end of five years, and the accounts for that period were adjusted and paid, a condition in the lease to pay the value of the unexpired term is void, the case not coming within the principle that executed contracts originally *ultra vires* shall stand good for the protection of rights acquired under a completed transaction.

Mr. Justice MILLER, after stating the case, delivered the opinion of the court:

The plaintiffs in error entered into a contract on the 8th day of October, 1863, with the Milville and Glassboro Railroad Company of New Jersey, which, in the resolution of the board of directors by whom it was initiated, is called a lease of the road. This agreement was confirmed by a vote of the stockholders, and was to continue for a period of twenty years from the first day of April, 1863.

It, however, contained a provision that the railroad company could at any time put an end to it upon three months' notice to the other party; but in that event arbitrators were to be chosen who should decide upon the value of the contract and the amount of damages incurred by and equitably and justly due to the other party by reason of such action. Under this provision the railroad company ended the contract and resumed possession of the road April 1, 1868.

About this time, by acts of the New Jersey legislature, the Milville and Glassboro Railroad Company was consolidated with the West Jersey Railroad Company, which succeeded to all the rights and obligations of the former company, and the road was delivered by plaintiffs, on the first of April, 1868, to the latter.

Efforts at arbitration, which it is unnecessary to recite here, having proved abortive, the plaintiffs in error brought the present action in the circuit court for the eastern district of Pennsylvania to recover the value of the contract and the damages sustained by them by its termination under the clause of the agreement already mentioned.

The court held the contract void, and instructed the jury to find a verdict for defendants. This writ of error brings up the judgment entered on that verdict for review.

The ground on which the court held the contract to be void, and on which the ruling is supported in argument here, is, that the contract amounted to a lease, by which the railroad, rolling-stock, and franchises of the corporation were transferred to plaintiffs, and that such a contract was *ultra vires* of the company.

It is denied by the plaintiffs that the contract can be fairly called a lease.

But we know of no element of a lease which is wanting in this instrument. "A lease for years is a contract between lessor and lessee, for possession of lands, &c., on

the one side, and a recompense by rent or other consideration on the other."—(4 Bacon's Abridgment, 632.)

"Anything corporeal or incorporeal lying in livery or in grant may be the subject-matter of a lease, and, therefore, not only lands and houses, but commons, ways, fisheries, franchises, estovers, annuities, rent charges, and all other incorporeal hereditaments are included in the common-law rule."—(Bouvier's Law Dictionary, "Lease;" 1 Washburn Real Property, 310, old paging.)

The railroad and all its appurtenances and franchises, including the right to do the business of a railroad and collect the proper tolls, are for a period of twenty years leased by the company to the plaintiffs, from whom in return it receives as rent one-half of all the gross earnings of the road. The usual provision for a right of re-entry on the failure to perform covenants, in addition to the special right to terminate the lease on notice, and the usual covenant for repairs and proper running of the road, equivalent to good husbandry on a farm, are inserted in the instrument.

The provision for the complete possession, control, and use of the property of the company and its franchises by the lessees is perfect. Nothing is left in the lessor but the right to receive rent. No power of control in the management of the road and in the exercise of the franchises of the company is reserved. A solitary exception to this statement, of no value in the actual control of its affairs, is found in the sixth clause of the lease, which covenants that the lessees will discharge any one in their service on the request of the corporation, evidenced by a resolution of the board of directors.

But while we are satisfied that the contract is both technically and in its essential character a lease, we do not see that the decision of that point either way affects the question on which we are to pass. That question is whether the railroad company exceeded its powers in making the contract, by whatever name it may be called, so that it is void.

It is, perhaps, as well to consider this question in the order of its presentation by the learned counsel for plaintiffs, upon whom the burden of showing the error of the circuit court devolved the duty of proving one of the following propositions:

1. The contract was within the powers granted to the railroad company by the act of the New Jersey legislature under which it was organized.

2. That if this be not established, the lease was afterwards ratified and approved by another act of that legislature.

3. That if both these propositions are found to be untenable, the contract became an executed agreement under which the rights acquired by plaintiffs should be legally respected.

The authority to make this lease is placed by counsel primarily in the following language of the thirteenth section of the company's charter:

"That it shall be lawful for the said company, at any time during the continuance of its charter, to make contracts and engagements with any other corporation, or with individuals, for the transporting or conveying any kinds of goods, produce, merchandise, freight, or passengers, and to enforce the fulfillment of such contracts."

This is no more than saying, "You may do the business of carrying goods and passengers and may make contracts for doing that business. Such contracts you may make with any other corporation or with individuals." No doubt a contract by which the goods received from railroad or other carrying companies should be carried over the road of this company, or by which goods or passengers from this road should be carried by other railroads, whether connecting immediately with them or not, are within this power, and are probably the main object of the clause. But it is impossible, under any sound rule of construction, to find in the language used a permission to sell, lease, or transfer to others the entire road and the rights and franchises of the corporation. To do so, is to deprive the company of the power of making those contracts which this clause confers and of performing the duties which it implies.

In *The Ashbury Railway-Carriage and Iron Co. vs. Riche*, decided in the House of Lords in 1875, and reported in 7 English and Irish Appeal Cases, 653, the memorandum of association, which, as Lord Cairns said, stands under the act of 1862 in place of a legislative charter, thus described the business which the company was authorized to conduct: "The objects for which this company is established are to make, sell, or lend on hire, railway-carriages and engines, and all kinds of railway plant, fittings, machinery, and rolling stock; and to carry on the business of *mechanical engineers and general contractors*; to purchase and sell, as merchants, timber, coal, metals, or other materials; and to buy and sell any such materials on commission or as agents." This company purchased a concession for a railroad in Belgium, and entered into a contract for its construction, on which it paid large sums of money. The company was sued afterwards on its agreement with Riche, the contractor, and the contract was held valid in the Exchequer Chamber by a majority of the judges, on the ground that while it was in excess of the power conferred on the directors by the memorandum, it had been made valid by ratification of the shareholders, to whom it had been submitted.

The House of Lords reversed this judgment, holding unanimously that the contract was beyond the powers conferred by the memorandum above recited, and being beyond the powers of the association, no vote of the shareholders whatever could make it valid. The case is otherwise important in its relation to the one before us, but it is cited here for its parallelism in the construction of the clause defining the powers of the company.

If a memorandum which described the parties as engaging in furnishing nearly all the materials, machinery, and rolling-stock which enter into the construction of a railroad and its equipments, and then empowers them to carry on the business of *mechanical engineers and general contractors*, cannot authorize a contract to build a railroad, surely the authority to build a railroad and to contract for carrying passengers and goods over it and other roads is no authority to lease it and with the lease to part with all its powers to another company or to individuals. We do not think there is anything in the language of the charter which authorized the making of this agreement.

It is next insisted, in the language of counsel, that though this may be so, "a corporate body may (as at common law) do any act which is not either expressly or impliedly prohibited by its charter: although where the act is unauthorized by the charter a shareholder may enjoin its execution; and the State may, by proper process, forfeit the charter."

We do not concur in this proposition. We take the general doctrine to be in this country, though there may be exceptional cases and some authorities to the contrary, that the powers of corporations organized under legislative statutes are such and such only as those statutes confer. Conceding the rule applicable to all statutes, that what is fairly implied is as much granted as what is expressed, it remains that the charter of a corporation is the measure of its powers, and that the enumeration of these powers implies the exclusion of all others.

This class of subjects has received much consideration of late years in the English courts, and counsel have relied largely on the decisions of those courts. Among the cases cited by both sides is that of *The East Anglian Railway Co. vs. The Eastern Counties Railway Co.* (11 Com. Bench R., 775).

In that case the Eastern Counties Railway Company had made a contract in which, among other things, it covenanted to take a lease of several other railroads whose companies had introduced into Parliament a bill for consolidation under the name of East Anglian Railways Company, and to assume the payment of the parliamentary expenses of this act of consolidation.

This covenant was held void as beyond the power conferred by the charter. "They cannot," said the court, "engage in a new trade, because they are incorporated only for the purpose of making and maintaining the Eastern Counties Railway. What additional power do they acquire from the fact that the undertaking may in some way benefit their line? Whatever be their object or prospect of success, they are still but a corporation for the purpose only of making and maintaining the Eastern Counties Railway; and if they cannot embark in new trades because they have only a limited authority, for the same reason they can do nothing not authorized by their act and not within the scope of their authority." This case, decided in 1851, was afterwards cited with approval by the lord chancellor in 1857, in delivering the opinion of the House of Lords in *Eastern Counties Railway Company vs. Hawkes* (5 Clark's House of Lords Report, 331), and it is there stated that it was also acted on and recognized in the exchequer chamber in *McGregor vs. The Deal and Dover Railway Company* (23 Law J., Queen's Bench, 69; 18 Queen's Bench, 618). Both these cases are cited approvingly in the opinion of Lord Cairns in the *Ashbury Company*, on appeal in the House of Lords.

This latter case, as decided in the exchequer chamber (Law Reports, 9 Exch., 224) is much relied on by counsel for plaintiffs here as showing that, though the contract may be *ultra vires* when made by the directors, it may be enforced if afterwards ratified by the shareholders or if partly executed.

But in the House of Lords, where the case came on appeal, this principle was overruled unanimously in opinions delivered by Lord Chancellor Cairns, Lords Selbourn, Chelmsford, Hatherly, and O'Hagan, and the broad doctrine established, that a contract not within the scope of the powers conferred on the corporation cannot be made valid by the assent of every one of the shareholders, nor can it by any partial performance become the foundation of a right of action.

It would be a waste of time to attempt to examine the American cases on the subject, which are more or less conflicting, but we think we are warranted in saying that this latest decision of the House of Lords represents the decided preponderance of authority, both in this country and in England, and is based upon sound principle.

There is another principle of equal importance, and equally conclusive against the validity of this contract, which if not coming exactly within the doctrine of *ultra vires* as we have just discussed it, shows very clearly that the railroad company was without the power to make such a contract.

That principle is that where a corporation, like a railroad company, has granted to it by charter a franchise intended in large measure to be exercised for the public good, the due performance of those functions being the consideration of the public grant, any contract which disables the corporation from performing those functions, which undertakes, without the consent of the State, to transfer to others the rights and powers conferred by the charter, and to relieve the grantees of the burden which it imposes, is a violation of the contract with the State, and is void as against public policy. This doctrine is asserted with remarkable clearness in the opinion of this court, delivered by Mr. Justice Campbell, in *The York and Maryland Line Railroad Co. vs. Winans*, 17 Howard, 30. The corporation in that case was chartered to build and maintain a railroad in Pennsylvania by the legislature of that State. The stock in it was taken by a Maryland corporation, called the Baltimore and Susquehanna Railroad Company, and the entire management of the road was committed to the Maryland company, which appointed all the officers and agents upon it, and furnished the rolling-stock. In reference to this state of things and its effect upon the liability of the Pennsylvania corporation for infringing a patent of the defendant in error, *Winans*, this court said: "This conclusion (argument) implies that the duties imposed upon the plaintiff by the charter are fulfilled by the construction of the road, and that by alienating its right to use, and its powers of control and supervision, it may avoid further responsibility. But those acts involve an overturn of the relations which the charter has arranged between the corporation and the community. Important franchises were conferred upon the corporation to enable it to provide facilities for communication and intercourse required for the public convenience. Corporate management and control over these were prescribed, and corporate responsibility for their insufficiency provided as a remuneration to the community for their grant. The corporation cannot absolve itself from the performance of its obligations without the consent of the legislature.—(*Beman vs. Rufford*, 1 Simon N. S., 550; *Winck vs. B. and L. Railway Company*, 13 Law and Equity, 506.)"

And in the case of *Black vs. Delaware and Raritan Canal Co.*, 22 N. Jer. Eq., 130, Chancellor Zabriskie says: "It may be considered as settled that a corporation cannot lease or alien any franchise, or any property necessary to perform its obligations and duties to the State, without legislative authority." Page 399. For this he cites some ten or twelve decided cases in England and in this country.

This brings us to the proposition that the legislature of New Jersey has given her consent by an act which amounts to a ratification of this lease.

That act is entitled "A supplement to the act entitled 'An act to incorporate the Milville and Glassboro Railroad Company,'" approved April 10, 1867; and its only purpose was to regulate the rates at which freight and passengers should be carried. It reads as follows:

"That it shall be unlawful for the directors, lessees, or agents of said railroad, to charge more than three and a half cents per mile for the carrying of passengers, and six cents per ton per mile for the carrying of freight or merchandise of any description, unless a single package, weighing less than one hundred pounds; nor shall more than one-half of the above rate be charged for carrying any fertilizing materials, either in their own cars or cars of other companies running over said railroad: *Provided*, That nothing contained in this act shall deprive the said railroad company, or its lessees, of the benefits of the provisions of an act entitled 'An act relative to freights and fares on railways in the State,' approved March 4th, 1858, and applicable to all other railroads in this State."

It may be fairly inferred that the legislature knew at the time the statute was passed that plaintiffs were running the road and claiming to do so as lessees of the corporation. It was not important for the purpose of the act to decide whether this was done under a lawful contract or not. No inquiry was probably made as to the terms of that lease, as no information on that subject was needed.

The legislature was determined that whoever did run the road and exercise the franchises conferred on the company, and under whatever claim of right this was done, should be bound by the rates of fare established by the act. Hence, without undertaking to decide in whom was the right to the control of the road, language was used which included the directors, lessees, and agents of the railroad.

The mention of the lessees no more implies a ratification of the contract of lease than the word "directors" would imply a disapproval of the contract. It is not by such an incidental use of the word "lessees" in an effort to make sure that all who collected fares should be bound by the law, that a contract unauthorized by the charter and forbidden by public policy, is to be made valid and ratified by the State.

It remains to consider the suggestion that the contract, having been executed, the doctrine of *ultra vires* is inapplicable to the case. There can be no question that in many instances where an invalid contract, which the party to it might have avoided or refused to perform, has been fully performed on both sides, whereby money has been paid or property changed hands, the courts have refused to sustain an action for the recovery of the property or the money so transferred.

In regard to corporations, the rule has been well laid down by C. J. Comstock, *Parish vs. Wheeler* (22 New York, 494), that the executed dealings of corporations must be allowed to stand for and against both parties when the plainest rules of good faith require it.

But what is sought in the case before us is the enforcement of the unexecuted part of this agreement. So far as it has been executed, namely, the four or five years of action under it, the accounts have been adjusted, and each party has received what he was entitled to by its terms. There remains unperformed the covenant to arbitrate with regard to the value of the contract. It is the damages provided for in that clause of the contract that are sued for in this action. Damages for a material part of the contract never performed; damages for the value of a contract which was void. It is not a case of a contract fully executed. The very nature of the suit is to recover damages for its non-performance. As to this it is not an executed contract.

Not only so, but it is a contract forbidden by public policy and beyond the power of the defendants to make. Having entered into the agreement, it was the duty of the company to rescind or abandon it at the earliest moment. This duty was independent of the clause in the contract which gave them the right to do it. Though they delayed its performance for several years, it was nevertheless a rightful act when it was done.

Can this performance of a legal duty, a duty both to stockholders of the company and to the public, give to plaintiffs a right of action? Can they found such a right on an agreement void for want of corporate authority and forbidden by the policy of the law? To hold that they can is, in our opinion, to hold that any act performed in executing a void contract makes all its parts valid, and that the more that is done under a contract forbidden by law, the stronger is the claim to its enforcement by the courts.

We cannot see that the present case comes within the principle that requires that contracts which, though invalid for want of corporate power, have been fully executed shall remain as the foundation of rights acquired by the transaction.

We have given this case our best consideration on account of the importance of the principles involved in its decision, and after a full examination of the authorities we can see no error in the action of the circuit court.

Judgment affirmed.

Mr. JUSTICE BRADLEY did not sit in this case.

In the United States circuit court for the district of Kansas. In equity.

THE WESTERN UNION TELEGRAPH COMPANY,	}
Plaintiff,	
vs.	
THE UNION PACIFIC RAILWAY COMPANY, THE Kansas Pacific Railway Company, and the American Union Telegraph Company, de- fendants.	

Motion to dissolve injunction.

OPINION OF MR. JUSTICE MILLER.

The suit in this case was brought by the Western Union Telegraph Company in one of the State courts of Kansas, and, on application to a probate judge of the proper county, an injunction was allowed which it is the purpose of the present motion to dissolve. The laws of Kansas make the indorsement of the county judge, on the petition that an injunction is allowed, to have the same effect as in the courts of the United States in equity proceedings is allowed to a writ of injunction regularly issued under the seal of the court.

The county judge made such an indorsement, allowing the injunction as prayed for by the bill. The prayer of the bill was in substance to restrain The Union Pacific Railway Company, The Kansas Pacific Railway Company, and the American Union Telegraph Company from interfering in any manner with the telegraph wires and other appurtenant apparatus of the Western Union Telegraph Company. The allegation on which the allowance was made was to the effect that the defendants were about to sever their connection between the wires of the Western Union Telegraph Company and its batteries, so that they could not be worked by the telegraph company, and to connect those wires with the batteries of The American Union Telegraph Company and with batteries of The Union Pacific Railway Company, and thus destroy the utility of those wires for the purposes of The Western Union Telegraph Company, which would be thereby excluded from the use of them for five or six hun-

dred miles, along which they now enjoy that use. There is no denial on the part of either of the defendants that they had such purpose, and it is a part of the case shown by the record, that after the granting of this injunction by the probate judge, these parties did sever the wires as threatened, and did connect them or attempt to connect them with The American Union Telegraph Company. An application was made to the probate judge after the allowance of this order to dissolve the injunction. This being refused, the case was removed into the circuit court of the United States for the district of Kansas, and there an application was made to Judge Foster to dissolve the injunction, which was overruled by him. A similar application was made to the circuit court in session, before Judges McCrary and Foster; and in that case, while the presiding judge held that there were certain inherent defects in the contract between The Kansas Pacific Railway Company and The Western Union Telegraph Company, under which the latter erected its wires and was operating them, which would probably authorize a dissolution of the injunction, he declined to dissolve it at the time, in order to give the plaintiff an opportunity, by amended bill, to make a case which would remove those defects. The plaintiffs accordingly filed an amended bill. A demurrer to the amended bill was overruled by Judge McCrary at chambers, whereupon defendants answered; and on that amended bill and answer and the original papers, another application was made before Judge McCrary at chambers, in Keokuk, for a dissolution of the injunction, and was by him set down to be heard before us at this time, in Saint Louis. This application has been heard before Judge McCrary and myself on all the original papers in the case—the amended bill and answer, and a very large number of documents and affidavits, now introduced for the first time. After a week of argument and a very careful consideration of the case, I propose to give the result of that consideration in the present opinion.

The line of telegraph which is the subject of the present controversy, extends from Kansas City, in Missouri, to Denver City, in Colorado, and consists of three wires, the requisite poles, batteries, and other machinery necessary to the successful working of those wires, erected along the line and on the right-of-way of the Kansas branch of The Pacific Railway Company. That branch has become consolidated with The Union Pacific Railroad Company, and they are both worked and held as one corporation, under the style of the Union Pacific Railway Company. The contract was made in the year 1866, between The Kansas Pacific Railway Company on the one part, and The Western Union Telegraph Company on the other, under which this telegraph line has been mainly erected and operated since it was erected. By that contract, about the construction of which the parties differ somewhat, there is no disagreement as to the following matters: Poles were to be erected on ground embraced within the right-of-way of the railroad company. That company was either to furnish the poles or to pay the price of them if furnished by The Western Union Telegraph Company, and to furnish one wire or pay the cost of that wire. The telegraph company was to furnish the batteries, and to furnish any other wire beyond that one, as it should become necessary, at their own cost. The erection of the poles, the attachment of the wires to them, and the expense of placing the batteries in position connecting them with the wires, was to be borne jointly and equally by the parties. The lines of these wires were both to be operated by operators appointed by the railroad company, and paid for jointly. The railroad company was to have the exclusive control and use of the first wire put up. The telegraph company was to have the exclusive use of the other wires until, in the opinion of the railroad company, the first wire should be insufficient for the demands of the business of the road; in which event, by a proper compensation, the railroad company was to have the use of another one of the wires put up by the telegraph company. It was one of the provisions of this contract that the railroad company should not send over its wire any commercial messages or any paid messages, or messages for any other person than for its own business; the purposes of which evidently was to leave the exclusive right to convey such messages to the telegraph company. And it was to enforce this clause of the contract that the injunction was obtained by The Western Union Telegraph Company in the State court. And it is to get rid of this provision and permit the railroad company to convey such messages, and to unite the wires of the telegraph company with The American Union Telegraph Company, that messages may be conveyed brought by The American Union Telegraph Company, over the wires of The Western Union Telegraph Company, that the present motion is made.

The first legal proposition involved in the case, as presented, is that The Kansas Pacific Railway Company is forbidden by the acts of Congress of the United States, under which it was built and under which it received large grants of money and public lands and other rights and privileges, to make any such contract as excludes or prevents it from carrying messages for the general public over the telegraphic lines erected on its right-of-way. I concur with Judge McCrary in the opinions delivered by him on the former applications before him to dissolve this injunction: that on the face of the acts of Congress of 1862 and 1864, called "The Pacific Railroad Acts," the obligation of building a telegraph line along its right-of-way, and of operating that

line or having it operated under the control of the railroad company, was an obligation which they could not abandon, and which was inconsistent with the contract made in this case, so far as those two acts are concerned; and that if the case rested on the provision of those original Pacific Railroad acts, namely, the act of 1862 and amendatory act of 1864, the present contract would be void, as in violation of the obligations imposed upon the railroad company by those acts; and I do not propose to add anything to what he has said on that subject. If, therefore, there are no other acts of Congress on the subject, nor anything else that will remove that inherent vice in the contract between the two companies, the injunction ought to be dissolved and the railroad company permitted to operate the telegraph in accordance with the obligations which those acts impose upon it for the benefit of the public. The amended bill, however, which was not before Judge McCrary when he decided that proposition, sets up an act, approved July 2, 1864, entitled "An act for increasing the facilities of telegraph communication between the Atlantic and Pacific States and the Territory of Idaho," and claims that by virtue of that statute the present contract is a valid one. The first section of that act declared that "The United States Telegraph Company and their associates were authorized to erect a line of magnetic telegraph between the Missouri River and the city of San Francisco, in the State of California, on such route as they may select, to connect with the lines of said United States Telegraph Company now constructed and being constructed through the States of the Union." It gave the right of way over the public lands of the United States and the right to draw materials for the construction of the line from the same public lands. The fourth section is as follows: "That the several railroad companies authorized by the act of Congress of July 2, 1862, are authorized to enter into an arrangement with The United States Telegraph Company, so that the line of telegraph between the Missouri River and San Francisco may be made upon and along the line of said road and branches as fast as said road and branches are built. And if said arrangement be entered into and the transfer of said telegraph line be made in accordance therewith, to the line of said railroad and branches, such transfer shall, for all purposes of the act referred to, be held and considered a fulfillment on the part of said railroad companies of the provision in the act in regard to the construction of telegraph lines. And in case of disagreement, said telegraph company is authorized to remove their line of telegraph along and upon the line of railroad therein contemplated, without prejudice to the rights of said railroad companies."

The allegation of the amended bill is, that the Western Union Telegraph Company was, at the time it made the contract for the erection of the telegraph line now in question, with the Kansas branch of the Pacific Railroad Company, the successor in right and in power of the United States Telegraph Company mentioned in this act. And that by virtue of the fourth section of the act the railroad company had the right to make the contract which was made, and was by that section relieved from the obligation to construct and operate a line of telegraph for the public use. It does not admit, in my opinion, of any reasonable doubt that if the United States Telegraph Company mentioned in that statute, or any company which had the same rights and authorities on that subject that that company had, entered into an agreement with the Pacific Railroad Company, or any of its branches built under the authority of the original act of 1862, which secures the proper construction and operation of a line of telegraph along its road for the benefit of the public, that it is absolved from the obligation imposed upon it by the act of 1862, to construct and to operate such a telegraph line. It was manifestly the design of this act of 1864 to enable the United States Telegraph Company to become substituted by a proper arrangement with the Pacific Railroad Company and its branches, to the right to build a telegraph line along the track and right-of-way of those railroad companies, and thereby to relieve those companies from the obligation to build and operate such a line. If, therefore, the contract is one which provides for the erection of a telegraph line to answer both the purposes of the public and of the railroad company, it is one which is authorized by this statute, and which relieved the railroad company from the obligation to construct and build another line, or any line. That such is the proper construction of the fourth section of this act of 1864, is obvious from an examination of section nineteen of the original act of 1862. That section provided, "that the several railroad companies herein named are authorized to enter into an arrangement with the Pacific Telegraph Company, the Overland Telegraph Company, and the California Telegraph Company; so that the present line of telegraph between the Missouri River and San Francisco may be moved upon or along the line of said railroad and branches as fast as said road and branches are built; and if said arrangement be entered into, and the transfer to said telegraph line be made in accordance therewith, to the line of said railroad and branches, such transfer shall for all purposes of this act be held and considered a fulfillment on the part of said railroad companies of the provisions of this act in regard to the construction of said line of telegraph."

The three telegraph companies here spoken of, together constituted at the time this

statute was passed, a continuous line of telegraph from the Missouri River to San Francisco; and it was obvious that the building of another line parallel to that, and not far distant from it, would have a very injurious effect upon the value of the property of those telegraph companies; and it was to protect those companies and to prevent the injury which would follow from the construction of another line between the same points over an uninhabited region of country, that Congress provided that by an arrangement with the railroad company, if those companies should remove their wires along the line of that road so they could be used both for railroad purposes and the use of the general public, then the obligation of the railroad company under the act of Congress to build another line should no longer exist. The act of 1864, which we have just referred to, concerning the United States Telegraph Company, was clearly designed to give it a similar privilege, and if the arrangement was made and that company should build or transfer its line to the line of the railroad company, the railroad company in like manner was released from the obligation to construct and build another line. I hold it, therefore, to be very clear that if the present telegraph line, as it is now operated and run by the Western Union Telegraph Company, can be traced to the authority of that act of 1864, and the Western Union Telegraph Company in making that contract exercised rightfully the powers conferred upon the United States Telegraph Company, that the contract is valid, although it forbids the railroad company to convey commercial messages over the single wire which it has the right to control for its own business.

It is said that the proof offered by complainants fails to show that it is the proper successor or in any manner entitled to the right which Congress conferred upon the United States Telegraph Company. The first item of evidence produced by complainants upon that subject is a certified copy of the organization of a telegraph company under the laws of the State of New York, styling itself "The United States Telegraph Company." The articles of association of that company, signed by three associates who had taken stock in it, acknowledged before the proper officer, were duly filed in the office of the clerk of the proper county; but it does not appear from anything before us, that the paper itself or any copy of it was ever filed in the office of the secretary of state of New York; and it is urged that this objection is fatal to the existence of such a corporation and of its right to make any contract, or transfer any privileges or rights to any other company.

The question here presented is one in regard to which there exists some conflict of authority in the decisions of the higher courts of other States which have adopted laws similar to that in New York. The State of Illinois, under a statute very similar, has decided that the failure to record a copy of the instrument, or deposit a copy of the instrument, in the office of the secretary of state, is not fatal to the validity of the organization. The State court of Indiana seem to have decided, in a case very nearly similar, that it is. However this may be, it seems to me that the Congress of the United States could adopt this imperfect or inchoate organization, needing nothing but the filing of a copy of its articles of association in the office of the secretary of state, and could, if it was the purpose of Congress to do so, confer upon it all the rights and powers which it has conferred upon the United States Telegraph Company; and the only question left, therefore, for consideration, is whether this company, of which the articles of association were presented by complainants, was the United States Telegraph Company to which the act of Congress refers. That company, very shortly after these proceedings, took steps to consolidate itself with three other telegraph companies, also organized or preparing to be organized under the authority of the laws of New York, and steps were taken, the proceedings of which are presented to us, which were manifestly designed in effect to amalgamate and consolidate and bring together in one organization, the rights and franchises, grants, and powers of each of them. This consolidated company adopted the name of the United States Telegraph Company, and it is recited in its articles of association that one of its elements is the United States Company, which existed prior to the act of Congress of 1864.

We see here a conscious effort, although there may be some imperfection in carrying that into effect, to unite the powers of this United States Telegraph Company, organized in 1862, prior to the act of Congress, with the powers of other companies, and to keep up its name and authority by the use of the same name in the consolidated company. This last United States Telegraph Company finally became consolidated with the Western Union Telegraph Company, or their fortunes became united and amalgamated in some shape not very clearly made out, and this is the action under which the Western Union Telegraph Company claims the right to make the contract which is the subject of consideration.

I am not prepared to say, with any degree of assurance, that if this case comes to a final hearing, and no more complete evidence is then given of the corporate existence of the first United States Telegraph Company of New York, and of the transfer of the powers granted to it by the act of Congress of 1864 to the Western Union Telegraph Company than has been presented on this hearing, that that contract can be sustained

under the act of 1864. But I am prepared to hold that there is no such clear case made against the right of the Western Union Telegraph Company to all the franchises and privileges of the original United States Telegraph Company, as to justify me in totally dissolving the present injunction, in view of the consequences which would follow such action, which will be hereafter considered. There is enough testimony to show that there was a purpose and design, through a series of transactions, to vest in the Western Union Telegraph Company the rights which the act of July 2, 1864, conferred upon the United States Telegraph Company, whatever company that might be. The existence of this United States Telegraph Company, and the assertion of the rights of the Western Union Telegraph Company under it, and the effort to show that the contract now in question was made under the act of 1864 with the successor of that company, is for the first time presented to the court at this hearing, and much that might make it plain either that there was such a right or that there was not such a right, may possibly exist and be brought to light hereafter, when the case can be heard at a final hearing on the issues made by the pleadings. And this branch of the subject will therefore be postponed for the present.

We must further hold that for the purposes of this motion to dissolve an injunction which has been four times before the consideration of the proper courts already, and which have thus far failed to dissolve it, there is sufficient evidence of the authority to make that contract under the act of 1864.

It is said that the Kansas branch of the Pacific Railroad Company was the successor of a corporation organized under the laws of Kansas, and not by the act of Congress, and the acts of Congress of 1862 and 1864, called "The Pacific Railroad acts," conferring upon that company the right to build a railroad and telegraph; and that because the Kansas branch of the Pacific Railroad Company does not owe its existence as a corporation to the United States, nor to any law of the United States, that, therefore, it is not bound by the provisions which would forbid it from making a contract such as that made with the Western Union Telegraph Company. But this proposition cannot be maintained. The corporation which accepted the grant of the United States of millions of money by way of subsidy, and millions of acres of land, and many other advantages, must be held to have accepted the entire act of Congress with all the conditions which it imposed. This was held in the Supreme Court of the United States in the recent sinking-fund cases (99 U. S. Sup. Ct. Rep. 700), in which the validity of the Thurman act requiring all those railroads to provide a sinking fund for the payment of their debt was resisted by the Central Pacific Railroad Company, organized under the laws of California, on the ground that Congress could impose no such obligation upon that road. This proposition, though urged upon the court very forcibly, and much relied upon in Judge Field's dissenting opinion, was overruled by the court; and it is held that in accepting grants made by Congress to those roads it bound itself by all the provisions of the act of Congress for the government of the companies.

Another ground of objection to the contract between the Western Union Telegraph Company and the railroad company under which this telegraph line was built, which objection goes to the validity of the whole contract, relates to a clause in it by which the telegraph company bound itself to carry over its line private and family messages of its executive officers without charge to them. The principle on which this objection rests is that this clause, securing a private advantage to certain officers of the railroad company, was in effect a bribe to secure from them the contract to the advantage of the telegraph company and the disadvantage of the railroad company. In one of the opinions delivered by Judge McCrary on the motions before him to dissolve or modify this injunction, he expressed the opinion that the clause in the contract, as it stood on its face, without any explanation of it, was fatal to the validity of the entire contract. I am not prepared now to either affirm or deny the soundness of that proposition.

The language of the contract on that subject is as follows:

"Fourth. The business of said railway, including its construction, lands, and all business of the company, and the family, private, and the social messages of the executive officers, shall be transmitted without charge between all telegraph stations on the line of said railway, and also between all such stations and the city of Saint Louis, Missouri, and over all other lines in Missouri, Kansas, Colorado, and New Mexico, now owned or controlled, or that may hereafter be owned or controlled, by The Western Union Telegraph Company; provided, as far as said lines in Colorado and New Mexico are concerned, the said road or roads of The Union Pacific Railway Company, Eastern Division, shall at the time be in process of construction towards Santa Fé, or Denver, or both; and all such business shall be transmitted free of charge, over all other lines owned or controlled, or that may hereafter be owned or controlled, by the said telegraph company within the United States, to an amount not exceeding the rate of four thousand dollars per annum; and for any excess above such rate the telegraph company will deduct and rebate one-half the regular tariff charges, settlements, and payments for such excess to be made yearly."

There arises on the face of this clause of the contract an ambiguity as to the precise

meaning of the words "executive officers." It is claimed by complainants that "executive officers" here referred to were not the directors, but were the president, superintendent, general manager, and other officers of that class. It must be confessed that there is nothing in the context and nothing in the definition of the word "executive," until application is made to the facts which concern the nature and functions of the various officers of the company, to determine whether the directors other than the president were included under the phrase "executive officers." If there has been a practical construction of that agreement by the acts of the parties during the twelve years that the contract has been in existence, further proof may show what that construction has been, and give light to the court in deciding the question. While I am strongly in favor of the assertion of the general proposition that where one of a body of individuals jointly interested in a matter consents to take a special advantage to himself and receives a valuable consideration for using his efforts to procure an agreement of the whole for the benefit of a third party, if such receipt of special advantages, whether of money or of property, be kept secret from his co-partners, or joint stockholders, or those interested with him in the same matter, and they act upon the belief that he is governed by no other interest than that which is common to them all, the contract so obtained on the part of the third person is flagitious and should be held to be void, there are circumstances in connection with this contract which may or may not be held to take it out of this principle. The first one of these circumstances which strikes one impressively is that there was no attempt to conceal from the stockholders of the railroad company, nor from anybody interested in its affairs, this clause of the contract by which the executive officers were to have this special privilege in the use of the telegraph wires. There was, therefore, absent the indication which secrecy in such case gives of a corrupt and improper motive. It is also to be observed that the benefits secured did not flow to the individual, but to the office, and that as soon as any one ceased to be a member of the executive office he ceased to have the privilege conferred by this contract; and there is no evidence before the court that this privilege was enjoyed for any length of time by any one individual, or that it amounted in point of fact to a pecuniary sum whose influence would be at all appreciable.

These propositions, and the facts which may be proved on the final hearing in regard to the terms under which these privileges were to be used, and the reasons why they were, as suggested by plaintiff's counsel, designed to relieve the railroad company itself of a burden which it would have borne if the telegraph company had not made these grants of privileges, all lead me to doubt very much whether the contract will be finally held invalid on account of that clause in its original conception. For the same reason, then, that I have already stated in regard to the other allegation of invalidity of the contract, that the objection may be removed on the final hearing; that it is not at all clear to me that the objection is a valid one as the matter stands, and on account of the great and important consequences which would flow from a dissolution of the injunction, I do not think that on this motion the objection should be held to be fatal to the contract.

I wish again to recall the fact that four or five motions to dissolve this injunction have been made and overruled as many times by as many as three or four different and very competent judges. It is also proper to look to the consequences which would flow from a dissolution of the injunction. It is made perfectly plain, both by the answer of the defendants and by what they have done and what they propose to do, that if this injunction is dissolved and another injunction which covers the telegraph along the line of the Union Pacific Railroad from Omaha to Ogden, that the Western Union Telegraph Company, which now and for twelve or fifteen years past has been working a continuous line, and the only line between the Atlantic coast and the Pacific coast, and especially between the Missouri River and San Francisco, will be at once deprived of the power to work any such line at all until it shall be enabled to construct a new line at least six hundred miles in length.

This corporation has come to be one whose property is of immense value—a value almost unknown to any one. The shares of its stock are scattered all through the country, and now are and long have been the most profitable shares of any corporation now in existence. It has done the business of almost the entire country for many years past west of the Alleghany Mountains—all the business west of the Missouri River. To suspend this business by the act of a single party, to permit the railroad company, both at Omaha and Kansas City, to cut off the connections of these wires with the Union Pacific Railroad Company east of those points, and to turn those wires into that of a rival company, is to produce an amount of financial ruin hard to be appreciated. Telegraph lines and telegraph business, like the good-will of a newspaper and hotel, have a character so different from ordinary personal property or ordinary real estate, that when we come to deal with injuries to it we must look at it in a different light from what we do the injuries to those classes of property.

The total suspension of its business for the period of time necessary to construct a line from Omaha or Kansas City to Ogden, would produce an irreparable injury within the meaning of that term as used in equity proceedings.

It would be an injury to that company by no means commensurate with any good to result to the other company which is in contest with it. It is eminently fit, therefore, that before the judges at chambers should pronounce an order dissolving an injunction which merely restrains the hands of the other side from this destructive proceeding, that they shall be satisfied that the rights of the party seeking this dissolution are clear, and that they are entitled to exercise the powers which will produce such disastrous results. As we have already said, we are not by any means satisfied, at least I am not, that such a right exists in the plaintiff; and I have a strong belief that it is the duty of the court to keep the hands of both of these parties so tied up, and so far at liberty only as that the public shall not suffer and each shall not destroy the other, until this litigation shall come to a final close by a full hearing on the merits of the case.

As I have already said, the injunction stands now upon the order of the probate judge in Kansas, an order which merely allowed the injunction as prayed in the bill. There seems to be a dispute between the counsel on either side as to the precise extent of the relief prayed in that bill, and, therefore, as to the extent and meaning of the injunction as it now stands. We are both of opinion that the railroad company has the right, as it has always had, to the exclusive use of the first wire on the telegraph poles; and we are of opinion that as the matter stands at this stage of the proceeding, that company should have the right, pending the further litigation of the case, to use that wire, not only for the ordinary business of the road, but for the purpose of transmitting commercial and paid messages for the public in general; that it has no right, to interfere with the Western Union Telegraph Company in the use of the other two wires for the purpose of carrying all messages of whatever class it may choose to carry over those wires; and that it is proper that an order should be made instead of the order of the probate court, which is ambiguous and indefinite, which shall stand to represent this principle, and as a substitute for that order.

APPENDIX M.

RECENT DECISIONS OF THE UNITED STATES COURT OF CLAIMS AFFECTING RAILROAD COMPANIES.

CHICAGO, MILWAUKEE AND SAINT PAUL RAILROAD CASE.

December Term, 1878.

THE CHICAGO, MILWAUKEE AND SAINT PAUL
Railway Company
v.
THE UNITED STATES.

On the Proofs.

Congress grant lands to the State of Wisconsin in trust to aid in the construction of a railroad, upon condition that the mail be transported over the road at such price as Congress may prescribe. The State passes a statute authorizing its officers to deed the lands to a railroad company when certain conditions shall be complied with. The lands are never deeded to the company, but are diverted to reimburse certain farmers who mortgaged their farms to aid in the construction of the road. The enterprise having failed, the claimants purchase the rights of the prior corporation and construct the road. The diversion of the land is with their consent and that of Congress. The claimants having carried the mail, the Post-Office Department insists that theirs is a "land-grant road," and the compensation subject to the deduction made in such cases. Also, that the contract rate is subject to a general reduction of 10 per cent., made by a subsequent act of Congress.

- I. If land granted by Congress in trust to the State of Wisconsin to be applied to the construction of a railroad be subsequently diverted to another purpose with the consent of Congress, viz, to the payment of debts contracted by individuals in a futile attempt to build the road, so that the company which in fact constructs the road never derives a benefit from the land, they will not be bound by a condition in the original statutory grant that the mail shall be carried at such rates as Congress or the Post-Office Department may prescribe.
- II. When Congress grant land in trust for a specific purpose, viz, to aid in the construction of a railroad, and subsequently passes a statute authorizing the land to be diverted to an entirely different purpose, the government will be estopped from claiming the benefit of a condition annexed to the original grant.
- III. A railroad which did not receive or participate in public lands granted by Congress to a State for railroad purposes is not a "land-grant road" within the meaning of the act 12th July, 1876 (19 Stat. L., 82, sec. 15).
- IV. Congress cannot by a legislative act vary the terms of a contract made under due authority of law for a term of time by duly authorized agents of the government.
- V. The Revised Statutes (section 3956) authorize contracts for carrying the mail for a period of not more than four years; and this provision is not controlled or limited by those of secs. 3679 and 3782.

- VI. Where a mail contract authorizes the government to discontinue the service at any time, in whole or in part, allowing the contractor one month's extra pay, and Congress during the term of the contract enact that the Postmaster-General shall deduct 10 per cent. from the compensation allowed to all railroads for carrying the mail and the contractors continue to carry the mail without objection, it will be held that the statute was in effect a notice under the contract that the service would be discontinued under the old rates and continued, if at all, under the new rates.
- VII. Though a statute order a reduction in the rates allowed for mail transportation, and direct that the reduction take effect from the beginning of the current fiscal year, nevertheless the statute will not operate retroactively as a notice to existing contractors.

(For report in full see vol. 14, Court of Claims Reports, pp. 125-144.)

Court of Claims—December Term, 1879.

THE ATCHISON, TOPEKA AND SANTA FÉ Railroad Company	} No. 11471.
THE UNITED STATES.	

FINDINGS OF FACT.

This case having been heard before the Court of Claims, the court, upon the evidence, finds the facts to be as follows:

I.

From about the 15th August, 1861, to about the 1st March, 1867, the War Department employed, to carry military freight and passengers, numerous railroad companies, for the construction of whose railroads grants of the public lands had been made upon the statutory condition that such roads should be and remain public highways for the use of the Government of the United States, free from all toll or other charge upon the transportation of any property or troops of the United States. Such transportation was not made under special contracts, but under a general rule of the department that payment of two cents per passenger per mile for the transportation of passengers, and for the transportation of freight the payment of such reasonable rates as might be allowed railroad companies, subject in each case to a deduction of 33½ per cent. as due to the government for charter purposes, should be a proper compensation for motive-power, cars, and all other facilities incident to transportation.

II.

On the 1st of March, 1867, this rule was changed, and thereafter, and until the act of June 16, 1874 (18 Stats. L., 74), took effect, like transportation was made for the government over said railroads, without special contracts, but under a general rule of the department that payment of the rates which such railroad companies charged to the public, subject, however, to a discount of 33½ per cent. as due to the government for charter privileges, should be such a proper compensation. The claimants were one of the land-grant railroad companies which so transported military freight and passengers for the government prior to the passage of said act, and received payment therefor under the said rule existing after March 1, 1867.

III.

By act of the legislature of the Territory of Kansas, passed February 11, 1859 (Private Laws of Kansas, 1859, p. 58), the Atchison and Topeka Railroad Company (which was the claimants' original style) was incorporated for the purposes therein mentioned.

No part of the road and branch road therein authorized was constructed prior to the passage of the act of Congress approved March 3, 1863, entitled "An act for a grant of lands to the State of Kansas in alternate sections to aid in the construction of certain railroads and telegraphs in said State" (12 St., 772), and the act of the legislature of the State of Kansas passed February 9, 1864 (Laws of Kansas, 1864, p. 149), entitled "An act to accept a grant of lands made to the State of Kansas by the Congress of the United States to aid in the construction of certain railroads and telegraphs, and to apply the same to the construction of such roads and telegraphs."

Pursuant to said acts, the claimants constructed their railroad from Atchison, in Kansas, to the western boundary of said State, in the direction of Santa Fé, N. Mex., a distance of 470.58 miles, and obtained the legal right to lands thereby granted, amounting to about 3,000,000 acres.

The claimants also hire and operate other lines of railroad in and near said State of Kansas, built without the aid of any grant of land from the United States.

IV.

Between March 31, 1875, and December 1, 1876, at the request of the War Department, made through its officer, the Quartermaster-General, they transported for the United States, in their own cars, by their own locomotive power, and by the services of their own servants, over their lines which were built without aid as aforesaid, military men and materials, the value of which transportation, according to the established rates of the petitioner company, of fare and freight at the times of such transportation, was of the amount of \$5,656.09. This sum and any part thereof has never been paid by the United States.

V.

During the same period the claimants transported for the defendants large quantities of troops and military stores over their land-grant railroad, in their own cars, by their own locomotive power, and by the services of their own servants. Such transportation was made at various times, as requisitions therefor were from time to time made by the defendants' duly authorized agents. No part of it was done under a contract as to the value of such service, or as to the amount to be paid for the same. The claimants have not been paid for the same, except as set forth in Finding XIV.

VI.

A similar service to that set forth in Finding V would, at the claimants' ordinary tariff rates charged to the public, be worth \$170,843.55.

VII.

If such ordinary tariff rates are to be taken as the basis of the calculation of the claimants' compensation, and if the said rule which governed the settlement of such accounts at the War Department and in the Treasury immediately prior to the said act of June 16, 1874, is to control the disposition of this case, the service set forth in Finding V is worth \$113,895.70.

VIII.

If said rates are to be taken as such basis and the value of the defendants' right to use the claimants' road and its immovable appendages should be ascertained by the testimony of experts in the manner set forth or referred to in the opinion of the court in this case, then 32.088 per cent. of the tariff rates is a proper deduction to be made for such use, and the worth of the said service is \$116,023.27.

IX.

The other lines of railroad hired and operated by the claimants, as set forth in Finding III, were leased at a rental during the period sued for of 44.98 per cent. of the gross earnings therefrom. During that period they were kept in repair by the claimants, at an average cost of 11.84 per cent. of the gross earnings received therefrom.

X.

If the claimants are entitled to recover for the reasonable worth of the service so performed by them for the defendants, computed upon the basis of the ordinary tariff rates charged by the claimants to the public for performing similar services, deducting therefrom the proportionate part of the cost of maintenance of way, and the proportionate part of the net profits during the period which the cost of the construction of the road and its immovable appendages bears to the combined cost of the road, rolling stock, and machinery, then 50 per cent. of such ordinary tariff rates is such reasonable worth.

XI.

If the claimants are entitled to recover for the advantages which the defendants reaped by reason of not being obliged to procure machinery and servants to perform the transportation done by the claimants, then the worth of that benefit to the defendants in the service sued for in this case was not proved, and there should be a rehearing on this point.

XII.

The following statements respecting the claimants' land-grant road from April 1, 1875, to November 30, 1876, both inclusive, are estimated or calculated by the auditor of the company from its books, and are to be taken as true, except that the capital

account in item 7, representing the cost of construction of the road and its immovable appendages, represents the face or par value of the stock and securities. The stock and securities were disposed of at a discount.

1. Number of passengers carried one mile on land-grant portion of the road, from April 1, 1875, to November 30, 1876	16, 053, 328
2. Number of passengers carried one mile on the same, during the same period, account United States Government	621, 595
3. Number tons of freight carried one mile on land-grant portion of the road, from April 1, 1875, to November, 30, 1876	76, 001, 732
4. Number tons of freight carried one mile on the same, during the same period, account United States Government	2, 617, 887
5. Net cost of transportation per passenger per mile over land-grant portion of the road, during same period	1.23 cents.
6. Net cost of transportation of freight per ton per mile over same portion of road, during the same period	1.17 cents.
7. Cost of construction of said land-grant portion of road, and the immovable appendages, during same period	\$22, 215, 611 59
8. Cost of equipment used on same during same period, excluding hired equipment	1, 224, 100 09
9. Average rental per year paid for hired equipment on land-grant road, during the same period	27, 754 60
10. Gross earnings of land-grant road, during the same period	2, 806, 946 60
11. Net earnings of land-grant portion of road from April 1, 1875, to November 30, 1876, excluding expenses of maintenance of way and buildings and taxes on immovable property	1, 724, 806 44
Net earnings of same portion of road, during the same period, including expenses of maintenance of way and buildings and taxes on immovable property	1, 250, 574 45

During the same period the cost of maintenance of way was \$381,010.41.

XIII.

The average rate per passenger per mile, charged by claimant to defendants for such transportation during said period, was 5.57 cents.

The average rate per passenger per mile, received by claimant for all passenger transportation, during the years 1875 and 1876, was 4.35 cents.

The average rate per ton of freight per mile, charged by claimant to defendants for such transportation during said period, was 5.03 cents.

The average rate per ton per mile, received by claimant for all freight transportation during the years 1875 and 1876, was 2.59 cents.

XIV.

Under the act of Congress approved March 3, 1879 (20 Stats. L., 390), the claimant has been paid \$79,748.44 on account of the transportation service over the land-grant road for which compensation is herein claimed.

XV.

The reports of twenty-five leading railroads in different parts and sections of the United States, as proved in this case, show aggregate results on a year's operations as follows: Cost of construction, \$3,715,725,980; cost of equipment, \$464,465,747; gross earnings, \$473,517,476; transportation expenses, \$302,290,323; maintenance of way, \$90,713,372.

Upon the foregoing findings of facts, the court decides as—

CONCLUSIONS OF LAW.

I.

The rule which governed the settlement of transportation accounts between the parties prior to the act of June 16, 1874, does not control in this case.

II.

Under the circumstances of this case the testimony of experts is not admissible to show the worth of the defendants' right to use the claimants' road.

III.

Under the circumstances of this case the worth of that right is not to be gathered from the terms of the leases of the branch roads which were hired and operated by the claimants.

IV.

The claimants are not entitled to recover in consideration of advantages which the defendants reaped by reason of not being obliged to procure machinery and servants to perform the transportation done by the claimants.

V.

The claimants are entitled to recover for transportation done for the defendants over their leased lines of railroads between March 31, 1875, and December 1, 1876, the sum of \$5,656.09.

VI.

For the reasons set forth in the opinion of the court, the claimants are entitled to recover for the transportation done for the defendants over their land-grant road between March 31, 1875, and December 1, 1876, 50 per cent. of the ordinary tariff rates charged to the public therefor—that is, the sum of \$85,421.76—less the sum of \$79,748.44, which has already been paid them on account thereof, leaving still due therefor \$5,673.32.

VII.

The claimants are therefore entitled to recover, on account of the demands referred to in conclusions V and VI, the sum of \$11,329.41, and as to the rest of their claim they are not entitled to recover, for reasons set forth in the opinion of the court.

OPINION.

DAVIS, J., delivered the opinion of the court:

In August, 1861, a dispute which had arisen between the War Department and the land-grant railroads was settled by a regulation that a special rate of two cents per mile should be allowed the government for passenger traffic and that the government freighting should be done for such reasonable rates as might be allowed to railroad companies, and that in both cases these rates should be subject to a deduction of 33½ per cent. as due to government for charter purposes.

It requires no special familiarity with railroad matters to know that these rates were favorable to the government. The passenger rate was below that charged in many parts of the country, and the agreement as to freights gave the government the benefit of contracts made with connecting lines for through freight.

This arrangement continued in force during the war, and until the 1st March, 1867, when the Quartermaster-General set it aside and substituted for it a rule of compensation less favorable to the government, by which the latter was to pay the rates, local or through, charged to the public for similar services, subject as before to a discount of 33½ per cent.

If it were necessary to seek for a reason for this change, it could be found in the increased cost of wages and material caused by the war, and in the diminution of government transportation after the war. For our purposes, however, it is sufficient to say that the new rule worked great changes. As applied to the bills now in suit it increased the passenger rates more than 150 per cent. The claimants have not furnished their contracts with connecting roads, and consequently the exact effect of the change on the freight rates cannot be stated.

The defendants, in examining the claimant's president as a witness, called upon him to furnish copies of the contracts with connecting roads. The witness refused to do this. The Attorney-General thereupon moved the court to compel the witness to answer the inquiry, contending that the government has still the right to participate in the advantages enjoyed by connecting roads under such contracts. We do not think so. We regard the rule of 1861 as terminated March 1, 1867. After the latter date, and until the act of 1874, which will be hereafter noticed, the government was bound to take ordinary rates as the basis of its computation. Since the passage of the act of 1874 a rule has prevailed, which makes it unnecessary to inquire into this class of contracts. In the absence of a necessity it would be manifestly improper to make such an examination, and we therefore overrule the motion.

No special transportation contracts were made with the claimants or with any other land-grant road, either under the old or the new rule. It was the custom to make requisitions for transportation from time to time as it was needed. The transportation was done as asked for, and was charged and paid for according to the rule existing at the time of its performance.

In this way a quantity of transportation was performed by the claimants for the defendants during the year terminating on the 31st March, 1875. The act of June 16, 1874, was enacted while this service was going on, and took effect on the 1st July, 1874. It provided that no money should be paid from the Army appropriation bill of that year to any railroad company for the transportation of any property or troops of the United States over any railroad which in whole or in part was constructed by the aid of a grant of public land, and on condition that such railroad should be a public highway for the use of the Government of the United States, free from toll or other charge; but that nothing therein contained should be construed as preventing any such railroad from bringing a suit in this court for the charges for such transportation and recovering for the same, if found entitled thereto by virtue of the laws in force prior to the passage of that act. (18 Stat. L., 74.) The Army appropriation act for the next year made this provision a permanent law. (*Ib.*, 453.) Thus it remained until the sundry civil appropriation act of March 3, 1879 (Session Laws, third session, Forty-fifth Congress, 390) when authority was conferred to pay the arrears withheld under the previous acts, to be adjusted by proper accounting officers in accordance with the decision of the Supreme Court, but in no event was more than 50 per cent. of the amount allowed by the Quartermaster-General to be paid until the decision of this court should be had in each case.

Between 1867 and 1874 there had been a great fall in the cost of wages and material, and some of the causes which had induced the rise in rates in 1867 no longer existed. The act of 1874 may therefore have been caused in part by a dissatisfaction in Congress with the continuance of the high rates. That body also undoubtedly wanted a decision from the highest court as to the liability of the government to pay anything for transportation over roads constructed by the aid of grants similar to those made to the claimant. Influenced by such considerations it put a stop to all payments for such transportation. And when the Supreme Court settled one of the disputed questions favorably to the railroads, in a proceeding which we shall soon consider, Congress expressed its willingness to settle the other, so far as pending claims were concerned, on the basis of rates recognized by the Quartermaster-General, provided the companies would accept 50 per cent. of the ordinary tariff rates instead of 66 2/3 per cent., which they had been receiving. But if they would not accept such a rate in full, Congress nevertheless authorized the 50 per cent. to be paid, and left it with this court to decide, in each case, on the merits of the particular case, whether the claimant is entitled to more.

We are, therefore, left in no doubt as to the view of the legislative department of the government concerning the worth of such service as the claimants rendered. It is worth, in the estimation of Congress, 50 per cent. of the ordinary tariff rates charged by the claimants to the public for similar services. But that body leaves the courts to determine whether the claimants, and other companies similarly situated, had earned a greater compensation in the transportation thus already performed which is referred to in the appropriation act of March 3, 1879.

The payment of the services which we have already referred to as rendered by the claimants for the defendants between March 31, 1874, and April 1, 1876, was refused in consequence of the passage of the act of June 16, 1874. The claimants then brought suit in this court to recover it. A *pro forma* judgment was rendered for the defendants, which was reversed above (93 U. S., 442). The Supreme Court decided, in effect, that the provision in the land-grant charters which exempts the government from toll applies only to the road and its immovable appendages, and not to the use of the equipment, machinery, and service. This court had found the standing rule in the War Department, already referred to, as one of the facts in that case, and that it was in force when the service commenced. On that finding the Supreme Court ordered the entry of a decree awarding compensation to the claimants, subject to a fair deduction for the use of the railroad.

On the receipt of the mandate this court, in awarding the compensation to the claimants, took into consideration such proof as was offered, and decided that it saw no reasonable ground for setting aside the judgment which had been entered by stipulation; that is, a judgment founded upon the departmental rule that the ordinary tariff rates, less 33 1/3 per cent., should form the measure of the worth of the service. The court above affirmed this, resting its conclusion not upon the alleged fact that the Quartermaster-General had agreed what the rate should be, but upon the fact that there was nothing to show that the rates fixed by the Quartermaster-General were not equitable and just. It expressly disclaimed a purpose to decide whether, after the passage of the act of June 16, 1874, the War Department could make an arrangement as to rates which should preclude the courts from considering and determining them.

The service covered by the claim in the present suit extends from March 31, 1875, the close of the service previously sued for, to December 1, 1876. A portion of it, amounting to \$5,656.09, is for transportation over branches which are not land-grant roads. No part of this has been paid, and the right to a judgment for it is not con-

tested. There was some contest about the service on the land-grant road. At the claimants' ordinary tariff rates, the transportation bills which were approved by the Quartermaster-General amounted to \$170,843.55, and it is admitted that the Quartermaster-General is of opinion that the service is worth that sum less 33½ per cent. discount as due the government for charter privileges.

The claimants demand—1st, the amount admitted by the Quartermaster-General, contending that the continued custom between the parties from 1867 to 1875, fortified as it is by the opinion which that officer still maintains, is a controlling element in the case; or, 2d, if we fail to find the amount admitted by the Quartermaster-General to be the reasonable worth of the service, then they ask a compensation at their ordinary tariff rates less 20 per cent. discount for the use of the road, contending that they have proved by the testimony of experts that 20 per cent. of gross transportation earnings is a reasonable and proper deduction for that use. They do not seek to recover either of these sums under an express contract. They admit that there was no express contract, and they now sue for the reasonable worth of the service which they rendered.

From this recital it appears that we are possessed of the whole case unhampered by any supposed restriction of the act of 1874 upon the power of the Quartermaster-General to make a contract, or by any alleged contract between the Quartermaster-General and the claimants, or by any ruling of the Supreme Court in the former case decisive of this.

If no contract was in fact made by the Quartermaster-General, it is immaterial whether the statute did or did not take away from him the power to make one. And if when the Supreme Court, in the former case, said that we should award a compensation to the claimants in that case for the transportation performed by them "subject to a fair deduction for the use of their railroad," it intended only to give directions how to reach a judgment in that case on the findings of fact, then the precise direction thus given related to that case only, and is not a precedent for our action in this.

In entering upon an inquiry as to the reasonable worth of the service, two considerations should be borne in mind.

1st. Neither party claims that, in the absence of an agreement as to a rate to be charged, there was a customary rate for such a service, which can be ascertained without mathematical calculations from the general results of the claimants' operations, or that, in fact, the claimants or any other railroad companies except land-grant companies similar to the claimant have carried for parties in that way. If either party could establish such a custom, or find such a customary rate, it would be an easy way of disposing of the knotty problem we have to solve.

2d. The claimants are entitled to recover, and that is what we have to ascertain, exactly and only what they collect from the public for the same kind and extent of service. The government is entitled to no favor, and, on the other hand, is not to be subjected to wrong. Its statutory contract with the claimants, as interpreted by the Supreme Court, when applied to work like that now sued for, and when the work is done as this was done, with reference on both sides to the rights of the government, obliges it to pay for that work at the claimants' ordinary tariff rates, through or local, as the hauling may be through or local, less so much of the same as are collected for and applicable to the portion of the claimants' property which the defendants are entitled to use without charge. It therefore follows that, in so far as the Quartermaster-General assumed the claimants' ordinary tariff rates as the basis for adjusting the amount of each transportation bill, he acted upon a principle which we must take as our starting point in the decision of this case.

The claimants first contend that the custom which prevailed from 1867 to 1875, and which the Quartermaster-General still regards as the equitable mode of measuring the payment due the claimants, is controlling and conclusive. If this contention can be sustained, it disposes of the case on a question of fact and puts an end to all controversy as to the law; for if it be true as a fact that the claimants are entitled to be paid two-thirds of the tariff rates for the service performed—there being no controversy in law as to the tariff rates or the amount of the transportation—there only remains a calculation which does not require the intervention of the Court of Claims. But when Congress, in 1874, enacted that no money should be thereafter paid to the claimants, but that they could bring suit here to recover for the charges of their transportation, and when, in 1879, it enacted that 50 per cent. of those charges might be paid, but that no more should be paid until a decision could be obtained in this court on each case pending therein, it clearly did not remit the charges to us for the simple purpose of an arithmetical calculation on the audited bills from the Quartermaster-General. On the contrary, Congress, in 1874, not only took away from the Quartermaster-General the power to make rates for transportation on the land-grant roads, but it set aside any conclusions of law or of fact which might be drawn from previous arrangements, and left us to decide the legal principles upon which to determine the settlement of the rates, subject to review above.

The claimants next contend that they have proved by experts that 20 per cent. of the gross transportation earnings of a railroad is a reasonable and proper deduction for the use of the road, and that they are therefore entitled to recover as compensation 80 per cent. of their tariff rates. The actual result from the experts' testimony is 32.688 per cent.

This mode of settling what may, for convenience, be called the ultimate fact in this case, is purely conjectural. It seeks to obtain a general result, derived from the operations of other railroads in the country, and to apply it to the claimants' road. It proposes that persons specially familiar with railroads and railroad accounts shall arrange these scattered facts, and shall deduce generalizations from them which are to form the basis of our judgment.

If the parties were themselves amicably adjusting a tariff rate, a percentage of earnings would undoubtedly be the most practicable and easy way for fixing it. In case of disagreement they could call in persons familiar with the business, and accept or reject their estimates at pleasure.

But in judicial proceedings such estimates, when once admitted in evidence, are no longer rejectable at will. An expert's opinion on a question of art or science is a fact which must be accepted by a jury, if uncontradicted. Art, in its legal significance, embraces every operation of human intelligence whereby something is produced outside of nature; and the term science includes all human knowledge which has been generalized and systematized and has obtained the forms of law, method, and relations. Because all persons have not leisure or capacity to master the principles of art or science, those who are specially skilled in either are allowed to give in evidence opinions which are received as facts when the issues involved make them material, and they are the best evidence obtainable.

There is nothing mysterious in a contest about the machinery, servants, and equipments of a railroad which calls for an expert to interpret operations or terms of art, or results of science. It is not an unusual thing in this court to ascertain from the different elements of cost which are proved how much an entire service is reasonably worth. It is no disrespect to the experts to say that the law regards us as competent to deal with the questions without their aid, and imposes upon us alone the duty of doing so.

Nor have the data upon which their conclusions rest that certainty of relation which entitles them to authority as a law of science. Railroads differ in their essential features as widely as individuals. No proper comparison can be made between the cost of maintaining a road like the Pennsylvania and its equipment with that of keeping a road and equipment up when the road is half ballasted, with trestle in the place of embankments and bridges, with cuttings not brought to slope, with light iron on the track, and with shanties for stations. A devastating flood may pour into the accounts of a single year an aggregate of maintenance of way greater than that of many ordinary years. A long icy and snowy winter may do the same with maintenance of equipment. A great accident may swell to a serious item the usually small percentage of damages to passengers and freight.

The conclusions which flow from these considerations are strengthened when we regard the actual differences between the experts. What is known as the Massachusetts formula gave in the former case as the deduction to be made from ordinary tariff rates for the government's right to the use of the road about 78 per cent. (12 C. Cl. R., 301). The opinions of other experts given in that case varied from 15 to 42 per cent. (*Ib.*, 302). In the present case the government Auditor fixes it at 43.53 per cent. One of the claimants' witnesses fixes it at 19.4. The Quartermaster-General thought, and still thinks, it is worth 33½ per cent. It was stated in argument that evidence is before a Congressional committee to show that it is worth but 22½ per cent. The findings fix the value of the service at the tariff rates at \$170,843.55. An easy calculation will show how widely these experts vary from each other, and how great an effect their differences would have upon the result.

These considerations force us to the conclusion that this mode of estimating and computing damages should not be adopted, unless it is impossible to find a better one.

The percentage of gross transportation charges which is equivalent to the percentage of gross earnings at the time of the service for which the claimants' road-bed and fixtures could be leased, the lessors making all repairs and renewals, is suggested by the defendants as a better rule; and they show, as the basis of the finding which they request on that point, that certain roads which are leased and operated by the claimants yield to the lessors 44.98 per cent. of their gross earnings as rent, and absorb 11.84 per cent. of the same for maintenance of way.

This mode of disposing of the question is open to even greater objections than the one which we have just rejected. A railroad is not a property that can be put into an agent's hands and rented like a furnished house in town. A main line may lease a branch, either to keep it out of the hands of a rival or to use it as a feeder. In the former case it may be willing to pay a higher rate than its real worth; in the latter it may be able, especially if it is the only outlet for the branch, to force a letting be-

low the real worth. In neither case does the hiring show, except with a distant approximation, what the main line itself would let for if offered in the market. From the very nature of the property, such a mode of estimating its value is uncertain, and can be resorted to only when more direct and simple ways fail. If the parties had not furnished us with a higher class of evidence, by means of which we can obtain a computation of damages founded upon the actual operations of the road during the period sued for, we should be justified in resorting to this class of proof. But, as higher and more direct evidence is within our reach, we have not felt justified in considering this, although we have embodied its results in our findings.

The problem which we are to solve is to find the amount which the public would pay for a similar service if the public had the same rights which the defendants have.

The findings profess to give us so many cents and so many fractions of a cent per mile per passenger or per ton of freight as the cost of the service. The defendants maintain that this cost is all to which the claimants are entitled; and they further contend that in any event it must be taken as a starting-point, and that only a reasonable profit for doing the work should be added to it.

This mode of computation would involve the abandonment of the principle we have already adopted, to give to the claimants what the public pay them for service of like character and extent. Every one must know that the reported cost of carriage is an average result, obtained from a review of the operations of the road during the period. The carriage was done in the ordinary trains of the claimants. Its cost is so intermingled with the cost of other service, that it is impossible to do more than to assign to this special service its proportionate part of the average cost of the whole during the same period. Even if it had been done for the defendants in separate trains, and the exact cost of the number of tons of fuel, and of the number of gallons of oil, and of the waste, and of the wages of the train servants during the time could be ascertained, which is doubtful, still the claimant would have been obliged in ascertaining the whole cost of the service to estimate the proportionate cost of station and switching service, of repairs of cars, of repairs of engines, of general expenses, and of similar items which are shared with other transportation.

In fact, in every mode of computation the result can be only an approximation; but the method which we adopt has this advantage over those which we have been considering, that it is an approximation founded upon the actual elements of cost which went into the special service, and upon the actual charges made for similar services rendered to the general public, and cannot be far from the exact truth.

We start in the inquiry with an accurate knowledge of what the public does pay for a similar service, *without* possessing the rights enjoyed by the defendants. The approved and audited bills from the quartermaster, made up at the time each service took place, at the rates at which individuals were charged for similar services, are conclusive on this point. We should find ourselves at sea, without rudder or compass, if we listened to the request of the Attorney-General to cut loose from this mooring, and drifted into a general inquiry as to what the rates ought to have been on the claimants' road during the twenty months in question.

Assuming the correctness of these bills as to the amount of the service rendered, and as to the rates paid for a similar service by the general public, the gross amount of the claimants' transportation earnings represents the aggregate of their receipts at tariff rates, just as the sum of all the bills rendered to the defendants and approved by their Quartermaster-General represents the aggregate of the transportation done for them at the same rates. From this amount of gross earnings we deduct the cost of the maintenance of the way and also the proportion of the net profits which the cost of the road bears to the combined cost of the road and equipment. What remains represents that part of the transportation earnings towards which the rates upon the transportation done for the defendants should compel them to contribute their proportionate part. This proportionate part is to be ascertained by a simple rule of three. As is the sum of the gross earnings to the sum of the service done for the defendants at the ordinary tariff rates, so is the remainder as above found to the sum we are seeking to find.

The first step in the above process is to deduct from gross earnings the cost of the maintenance of way. Tariff rates are established and collected first for the purpose of paying for the actual cost of the transportation, and second in order to remunerate the owners of the property for its service in doing the work. All earnings not consumed in doing the work and preserving the property remain as resulting profits, to be disposed of for the benefit of the owners of the property.

It is apparent that this theoretical division of the receipts of a corporate common carrier calls for the payment of all corporate expenses as part of the cost of transportation, and that its property must be kept from depreciation out of earnings before profits can be earned. But the law, as construed by the Supreme Court, says that no earnings shall be gained by transportation for the defendants for the purpose of maintenance of way, when that transportation is done, as the present service was done, with reference to the defendants' rights under the statute. For this reason, in this

computation we first deduct from gross earnings all expenditures for maintenance of way. We understand by this term not only the outlays for keeping up the road, the road-bed, the track, the turn-outs, the switches, the bridges, the fences, and other structures and similar property incidental to the completed way, constructed for and used as a railroad, but also the outlays upon the stations, water-tanks, and other similar immovable appendages to the road which are necessary to keep them in repair, and the taxes upon the same species of property. We also understand it to include outlays upon machine-shops and other similar buildings constructed and used for machinery and equipment; because the defendants, if they operated the road with their own rolling-stock, would have the right to use those structures for keeping their equipment in repair.

We next deduct from what remains of the gross earnings such proportionate part of the net profits of the road as the cost of the road bears to the combined cost of the road and equipment.

In our division of earnings we have seen that one part goes to pay the cost of earning them. What remains is the net profit or net earnings of the owners of the property. For the purposes of this suit it is entirely immaterial what disposition is actually made of them; whether they go to the payment of debt, or of interest on a debt, or to improve the property, or are distributed. We are only to inquire whether any portion of these net results from the imposition of rates go, in theory, to a quarter which has no right to impose rates upon the defendants. Before doing this, we repeat, in order to give it prominence, the principle that transportation rates are imposed by a railroad company for the purpose of affording a remuneration to capital; for upon this principle hinges this part of the case. It has been obscured by the evidence of the experts; but if the dead mass of a corporation were not interposed, and we were dealing with a living individual, the proposition would be self-evident. An individual transporter in a wagon or a stage-coach, for instance, demands from the public rates which will not only return to him his outlays, but pay him a profit. He does not divide his profit between his stable and his coach or his wagon, as some of the experts would have the railroad companies do, but he puts it in his pocket. If he has a partner, they divide it. If one partner has contributed more capital than the other he gets a proportionate share of the profit; if one contributes more time, knowledge, and experience than the other he gets his proportionate reward; and if the two partners contract with a third party to transport for him at the customary rates, less the share of the profits which one of the partners would earn, they would have no difficulty in determining, after performance of the service, how much the third party ought to pay.

The present case is to be settled on precisely similar principles. There are two species of property owned by the claimants. They can and do tell us how much each has cost. The defendants have the right to use the one; they have no right to use the other. The two are used together by the claimants for the purpose of earning money, and a rate is charged which is intended to enable both to earn money. There is no stipulation that one kind of property is to earn at one rate and the other at another. Both are on an equality. If the two were owned by different proprietors, and the net profits were distributable according to the capital in each, there would be no room for argument as to our duty. To us there seems to be as little room for it on the facts presented in the findings. If the public pay rates which yield a net profit, the government must pay rates to yield the same profit upon the capital invested in the property which it is not entitled to use without compensation; and if the rates charged the public yield no profits, the government is under no obligation to pay larger rates.

The remainder which we have reached in our computation, represents earnings from rates which the claimants have the right to impose upon the defendants, viz: rates to earn all other payments on account of the service employed in transportation—whether on the trains, or in the yards, or in the stations, or at the agencies; for the cost of moving the trains; for the hire of the rolling-stock; for taxes on the equipment, or on the capital paid invested in it; for telegraphs; for advertising; for loss and damage to passengers or freight; for legal expenses; for general expenses; in short, for all outlays necessary to their business as common carriers, except the outlays for maintenance of way as above defined; and also for the payment of net profits on equipment.

The defendants should pay that proportionate part of this remainder which the sum of their transportation at ordinary rates bears to the gross transportation earnings of the road. The gross transportation earnings of the road were \$2,806,946.60, and the gross amount of the defendant's bills was \$170,843.55. This proportion is, therefore, represented by the fraction $\frac{170843.55}{2806946.60}$.

The findings show the cost of maintenance of way during the period to have been \$381,010.41; and the net earnings to be \$1,250,574.45. The capital account, as it appears by the books, shows the cost of the road and equipment to have been \$23,439,771.68, of which \$22,215,611.59 represent the cost of the road, and \$1,224,160.09 represent

the cost of the equipment. Assuming this proportion to be correct, the result would be thus stated:

Gross earnings	\$2,806,946 60
Deduct:	
Maintenance of way	\$381,010 41
Proportion of profit earned by the road	1,185,262 23
	<hr/> 1,566,272 64
Proportionate part of earnings to which the defendants should contribute	1,240,673 96
	<hr/> 2,806,946.60 : 170,843.55 :: 1,240,673.96 : 75,513.06.

This computation yields the practical result of 55.8 per cent. of gross earnings as due for the use of the road, and 44.2 per cent. thereof as due the claimants for transportation.

But the claimants' capital account in the construction of their road is swelled beyond its actual cost by reason of a discount in the sale of stock and securities, so that, it is said, the proportion of net earnings thus assigned to the road is not the true proportion. This contention is set up by the claimants. It is completely answered by saying that the claimants have not proved the amount of the discount. Their witness states, and we have found it as a fact in the exact language of the witness, that the stock and securities represented in capital account for construction were sold at a discount. There the witness stops, and there the finding stops. It was within the power of the claimants, and it was not within the power of the defendants, to complete the proof on this point by showing what was the actual amount of the discount in the sales of those stocks and securities. In the absence of that proof we must take the capital account, as it stands on the books, at par value, as the true cost of construction. We are not required to consider, and it would be improper for us to indicate, what we might have done had the claimants completed the proof on this point.

Taking, however, the average relation between cost of road and cost of equipment deduced from the reports of the twenty-five railroads referred to in Finding XV, we have 88.9 per cent. as the cost of the road and 11.1 as the cost of equipment. Adopting this relation, we have a result of \$79,986.70 as the amount of the claimants' compensation, instead of \$75,535.50, which yields 53.2 as the percentage for the use of the road, and 46.8 as the percentage due the claimants.

Abandoning the particular operations of the claimants' road, and taking the average operations of the roads referred to in Finding XV, we have, in round numbers, the following results:

Gross earnings	\$473,517,000
Deduct:	
Maintenance of way	\$90,713,000
Proportion net earnings earned by road	152,206,000
	<hr/> 242,914,000
Balance	<hr/> 230,603,000

Taking this proportion, we have a result of \$83,200.88 as the sum to be paid to the claimants, or 51.3 per cent. as the allowance for the use of the road, and 48.7 as the percentage due the claimants.

In view of these different results, obtained from independent calculations, all approximating to an equal division of the gross earnings between the road and service, we can have no doubt that when Congress in 1879 authorized the payment of 50 per cent. of the approved bills of the land-grant roads, it intended to give its assent to the principle that 50 per cent. of the gross earnings is on the whole a just remuneration for the services and the profits which we have included in this computation.

The exact proportion between the cost of a road and the cost of its equipment varies in different roads and in the same road at different times. But in view of the obvious necessity of establishing a fixed relation to govern current payments for work as done, unless the practice of refusing payment and sending claimants here is to be perpetuated, and in view of the manifest advantage of having that rate the same with all the roads, Congress has practically agreed that, irrespective of the particular relations between the cost of a road and the cost of its equipment, 50 per cent. of its gross earnings is a fair compensation to the company for the actual cost of transportation and such part of the profits upon transportation as are earned by the company out of the government. We have, therefore, felt ourselves justified in finding as a fact that 50 per cent. of gross earnings is such a proper compensation.

Certain manifest advantages which accrued to the defendants from this arrangement, and which must have had a pecuniary value to them, but which entailed no pecuniary loss upon and no damage to the claimants, do not form part of that compensation. If

the claimants are entitled to have them enter into the computation of damages, then their value, if it can be ascertained, should be added to the 50 per cent. of gross earnings which the claimants are entitled to.

The rights of the defendants are clearly marked out, and the boundaries thereof defined, by the Supreme Court:

"All that the act reserves is the free use of the railroad. Of course, this implies also the free use of all fixtures and appurtenances forming part of the road, and which are essential to its practical use. The free use of the railroads does not entitle the government to have troops or property transported by the companies over their respective roads free of charge for transporting the same. * * * The objection that it would be inconvenient for government to provide locomotives and cars for the performance of its transportation cannot properly be urged. The government can do what it always has done, without experiencing any difficulty—employ the services of the railroad and transportation companies which have provided these accommodations." (*Lake Superior and Miss. R. E. Co. v. The United States*, 93 U. S., 453-454.)

If the government were thus compelled to haul its own transportation over the land-grant roads, it would have to keep engines and cars, and fuel and machinery, and maintain a large staff of servants upon every such road, and would be put to great expenses, which were avoided by the arrangements actually made with the companies. Instead of requiring the defendants to incur this expense, the claimants agreed, during the period now sued for, to do the handling and hauling for them, and to regard the statutory rights of the defendants as a proper subject for consideration in estimating the worth of such services. The advantage which the defendants gained thereby had an appreciable money value. An executive officer bargaining for future transportation would undoubtedly take this into consideration in making his bargain, and the company would probably have it in view in demanding a rate; but in a judicial proceeding to recover the reasonable worth of the transportation, where there was no previous agreement, it is outside of the legal rule for the computation of damages. It was not part of the costs of the service nor part of the profit resulting from doing it, and it caused no pecuniary loss to the claimants.

In actions *ex-contractu* damages are given as a compensation to the plaintiff for injuries which he has received from the defendant. They must be the result of the injury—that is, they must result to the plaintiff from the injury; and they must be commensurate with the injury sustained.

Applying these simple elementary tests to this claim, it appears that the advantage which the defendants gained formed no part of the injury which the claimants received; and to pay its worth to the latter would not be giving them commensurate compensation for an injury which resulted to them, but a gratuity commensurate with a benefit which resulted to the defendants. Even in actions *ex-delicto* to recover damages for infringements of patent rights, where the benefits resulting to the defendant are sometimes considered in computing damages, it is only done when it evidently forms the only measure for the plaintiff's loss. "It is only where, from the peculiar circumstances of the case, no other rule can be found, that the defendant's profits become the criterion of the plaintiff's loss." (*Seymour v. McCormick*, 16 How., 490.)

We exclude this element in the computation of damages. If we admitted it we should still have to ascertain the worth of the advantages gained by the claimants from the same causes. They escaped the exercise by the defendants of their statutory right to put trains on the road, and thus interfere with its ordinary traffic and derange their time-tables. The company would undoubtedly take this fact into consideration in making a bargain; but it is outside of the subjects which we can properly consider in computing the damages in this case.

If these advantages and counter-advantages were proper subjects for consideration in that connection we should feel obliged to send the case back for further hearing. It is true that the long custom between the parties to pay and receive 66 2/3 per cent. of the ordinary tariff rates as a proper compensation for transportation would afford some presumption that 16 2/3 per cent. of those rates is, on the whole, a fair adjustment of the balance of gain from the defendants' abandonment of their right to do their own transportation. Counsel on both sides, however, argued the case on other theories, and without considering this point.

The claimants' damages on this branch of their case are therefore limited to 50 per cent. of the bills for the land-grant service audited and approved by the Quartermaster-General; that is, to 50 per cent. of \$170,843.55. This amounts to \$85,421.76. Of this sum the claimants have already received \$79,748.44, leaving due \$5,673.32. Adding this amount to the \$5,656.09 already found due for transportation over the non-land-grant branches of the claimants' road, we have \$11,329.41 as the amount of the judgment in the claimants' favor.

Judgment will be entered accordingly.

APPENDIX N.

Government directors of the Union Pacific Railway Company, appointed by the President May 12, 1880.

George B. Smyth.....	Keokuk, Iowa.
Charles C. Housel.....	Omaha, Nebraska.
Ralph P. Buckland.....	Fremont, Ohio.
Daniel Chadwick.....	Lyme, Connecticut.
Judson Kilpatrick.....	Deckertown, New Jersey.

APPENDIX O.

UNITED STATES BOND AND INTEREST ACCOUNT WITH SUBSIDIZED RAILROADS.

Statement of the accounts between the United States and the Pacific railroads on account of bonds and interest to June 30, 1880.

Titles of companies.	Indebtedness of companies on account of bonds and interest.		
	Principal.	Interest.	Total.
Union Pacific Railway Company.....	\$27,236,512 00	\$30,055,378 25	\$47,291,790 25
Central Pacific Railroad Company.....	25,885,120 00	18,798,293 67	44,673,353 67
Western Pacific Railroad Company.....	1,976,566 00	1,313,548 14	3,290,103 14
Kansas Pacific Railway Company.....	6,303,000 00	4,994,793 09	11,297,793 09
Central Branch Union Pacific Railroad Company.....	1,600,000 00	1,261,806 26	2,861,806 26
Sioux City and Pacific Railroad Company.....	1,623,326 00	1,171,199 89	2,794,519 89
Total.....	64,623,512 00	47,589,861 30	112,213,373 30

Titles of companies.	Amounts repaid and in the Treasury of the United States.				
	One-half of trans- portion ap- plied to pay- ment of bonds and interest.	One-half of trans- portion with- held on account of 5 per cent. of net earnings.	Cash payment on account of 5 per cent. of net earnings.	Total on account of interest and 5 per cent.	One-half of trans- portion with- held on account of sinking fund.
Union Pacific Railway Company..	\$5,080,969 73	\$2,723,514 64	.....	\$7,804,484 37	\$582,504 23
Central Pacific Railroad Company..	1,967,666 87	1,242,722 77	\$648,271 96	3,845,661 60	378,872 24
Western Pacific Railroad Company..	9,385 75	1 25	.....	9,387 00	.....
Kansas Pacific Railway Company..	1,764,992 91	682,494 37	.....	2,447,397 28	.....
Central Branch Union Pacific Rail- road Company.....	33,136 89	14,484 89	6,926 91	54,548 69	.....
Sioux City and Pacific Railroad Company.....	54,578 35	51,454 22	.....	106,032 57	.....
Total.....	8,900,620 41	4,714,672 14	655,198 87	14,270,491 42	911,376 47

Statement of accounts between the United States and the Pacific railroads, &c.—Continued

Titles of companies.	Amounts repaid and in the Treasury of the United States.				Balance.
	Cash payment on account of sinking-fund.	Interest on bonds belonging to the sinking-fund.	Total on account of sinking-fund.	Total in the Treasury.	
Union Pacific Railway Company		\$12,778 11	\$545,282 34	\$8,349,706 71	\$96,043,022 54
Central Pacific Railroad Company	\$181,329 51	9,285 62	569,487 37	4,418,148 97	40,399,304 79
Western Pacific Railroad Company				9,387 00	2,274,741 14
Kansas Pacific Railway Company				2,417,397 23	8,650,385 81
Central Branch Union Pacific Railroad Company				54,548 00	2,807,250 06
Sioux City and Pacific Railroad Company				106,632 57	2,093,487 32
Total	181,329 51	22,063 73	1,114,769 71	15,385,261 13	96,628,112 17

APPENDIX F.
UNITED STATES TRANSPORTATION ACCOUNT WITH SUBSIDIZED RAILROADS.

Statement of the transportation accounts, and of the accounts between the United States and the Pacific railroads on account of moneys retained for interest paid on bonds, on account of five per cent. of net earnings, and on account of sinking funds, to December 31, 1879.

Names of companies.	Less—				One-half applicable to payments on account of interest.	One-half applicable to payments on account of five per cent.
	Total transportation charge.	Amount paid companies prior to act of 1873 and since.	Amount retained for sinking funds.	Amount of transportation on subsidized railroads.	Total.	Remainder applicable to settlement of interest, five per cent. and sinking funds.
Union Pacific.....	\$12,166,013 57	\$2,357,455 07	\$2,357,455 07	.....	\$4,714,910 14	\$7,451,103 43
Central Pacific.....	4,762,846 22	758,639 69	724,308 62	\$524,857 46	2,009,905 77	2,743,040 45
Kansas Pacific.....	3,676,489 14	1,112,338 97	1,081,997 48	851,932 85	3,046,289 40	630,199 74
Central Branch Union Pacific.....	101,124 64	37,678 79	19,084 66	4,279 01	61,042 46	40,082 18
Sioux City and Pacific.....	149,893 00	59,055 46	21,625 20	15,222 73	65,903 39	83,989 61
Footings.....	20,846,366 57	4,295,187 98	4,204,471 03	1,398,292 15	9,897,851 16	10,948,415 41
Names of companies.	Payable by companies.		Less—		Balance payable by companies in cash.	Balance due the companies by the United States.
	Five per cent. of net earnings.	Requirement for sinking funds.	Total.	Amount transportation on subsidized railroads.	One-half transportation on subsidized railroads applicable to payment five per cent.	
Union Pacific.....	\$2,644,160 07	\$1,104,465 37	\$3,748,625 44	.....	\$3,725,551 71	.....
Central Pacific.....	2,158,801 15	798,454 32	2,957,055 47	\$526,857 46	1,371,520 22	.....
Kansas Pacific.....	1,522,114 98	522,114 98	522,114 98	851,832 85	1,315,099 87	\$644,917 84
Central Branch Union Pacific.....	126,273 87	.....	26,273 87	4,279 01	20,041 09	.....
Sioux City and Pacific.....	14,000 00	.....	4,000 00	15,222 73	41,994 80	.....
Footings.....	5,355,150 07	1,902,919 69	7,258,069 76	1,398,292 15	1,083,705 29	698,135 37

1879 estimated.

* This amount has been paid into the Treasury by the company.

APPEN

"FIVE PER CENT. OF NET EARNINGS" ACCOUNTS OF THE KANSAS PACIFIC RAILWAY,
COMPA

KANSAS PACIFIC

STATEMENT a.—*Earnings and expenses, 394 miles of Kansas Pacific Railway, subsidiz*
For ten years, from November 2, 1868, to November 1, 1878, in

Year ending November 1.....	1869.	1870.	1871.	1872.
MILEAGE OF ROAD.				
Main line.....	405	517	639	639
Leavenworth branch.....	34	34	34	34
Subsidized line.....	394	394	394	394
EARNINGS.				
Freight:				
Ordinary.....	\$1,021,731 27	\$1,199,433 59	\$1,051,526 39	\$1,304,559 70
Government.....	334,990 39	106,787 81	91,831 17	50,615 03
Contractors.....	59,108 20	357,635 84		
Company.....				
	1,415,829 86	1,663,807 24	1,143,357 56	1,864,174 73
Passenger:				
Ordinary.....	432,450 85	551,369 76	631,570 51	644,019 67
United States troops.....	91,556 08	73,660 13	37,441 03	49,020 55
Expresses.....	24,432 10	34,369 94	36,683 62	49,176 82
Mails.....	59,020 19	52,137 85	37,023 09	46,021 56
	607,459 22	711,537 68	742,718 25	788,238 60
Miscellaneous:				
Rents.....	23 35	125 87	2,613 75	14,867 01
Individuals and companies.....	5,194 95	14,490 79	21,429 95	28,812 77
Sundry sources.....	3,347 48	3,868 92	6,196 61	3,031 49
	8,565 78	18,505 58	30,240 31	46,711 27
	2,031,854 86	2,393,850 50	1,916,316 12	2,199,124 60
Real estate sales.....		1,175 15	1,973 40	3,580 00
		1,175 15	1,973 40	3,580 00
	2,031,854 86	2,395,025 65	1,918,289 52	2,202,704 60
EXPENSES.				
Conducting transportation.....	270,128 07	424,034 07	384,239 58	353,140 69
Motive power.....	439,113 03	565,780 67	449,782 27	420,810 91
Maintenance of cars.....	84,090 37	143,559 92	122,623 52	102,681 53
Maintenance of way.....	328,440 44	373,187 28	387,540 45	352,693 97
General expense.....	61,205 64	72,569 21	106,443 17	71,567 14
Taxes:				
State, county, and city.....	a79,011 23	a75,831 71	a80,990 77	a66,800 35
Construction.....	b117,829 82	c431,991 24	d241,365 05	e58,241 47
Equipment.....	j88,867 75	k440,353 56	l119,873 06	m3,542 29
Real estate, for use of road.....	a2,784 05	a61,977 88	a14,499 15	a1,279 83
Insurance.....		a15,162 39	n16,999 51	o21,245 67
	1,451,470 40	2,603,272 78	1,904,346 53	1,446,004 85
Net earnings.....	580,384 46		13,942 99	756,699 75
5 per cent. of net earnings.....	29,019 22		697 15	37,834 99
Interest on 6 per cent. first-mortgage bonds:				
Coupons.....	320,324 81	356,840 27	367,607 50	372,420 49
Premium on gold.....	121,028 35	36,965 39	48,223 33	46,687 30
Commissions.....	1,404 90	842 10	283 66	
Coupon scrip certificates.....				
Interest on scrip certificates.....				
Interest on scrip certificate coupons.....				
United States tax.....	25,172 44	19,716 09	10,452 96	5,537 14
	467,930 50	414,393 85	426,567 45	424,044 93
Applicable to payment of 5 per cent.....	112,453 96			332,054 82
5 per cent. of net earnings payable per this statement.....	29,019 22			37,834 99

a Actual. b $\frac{2}{3}$ of \$131,287.54. c $\frac{1}{3}$ of \$804,129.88. d $\frac{1}{3}$ of \$412,280.91. e $\frac{1}{3}$ of \$99,483.52.
f $\frac{1}{3}$ of \$615,824.39. g $\frac{1}{3}$ of \$204,757.79. h $\frac{1}{3}$ of \$6,032.37. i 70% of \$24,285.02. j 70% of

DIX Q.

CENTRAL BRANCH UNION PACIFIC RAILROAD, AND SIOUX CITY AND PACIFIC RAILROADS.

RAILWAY.

ed by the issue of United States bonds, under acts approved July 1, 1862, and July 2, 1864.
clusive, prepared by the Office of the Auditor of Railroad Accounts.

1873.	1874.	1875.	1876.	1877.	1878.	Total.
639	639	639	638	638	638	
34	34	34	34	34	34	
394	394	394	394	394	394	
\$1,282,319 77	\$1,122,740 20	\$1,222,881 11	\$1,176,422 66	\$1,526,748 83	\$1,931,811 40	
32,814 26	20,664 12	30,937 75	42,922 51	26,095 26	27,965 62	
				81,340 92	93,250 98	
1,315,134 03	1,143,404 32	1,253,818 86	1,219,345 17	1,634,185 01	2,058,028 00	
725,239 19	630,007 29	549,526 77	434,974 84	457,532 98	570,489 12	
21,036 53	30,501 46	29,712 54	34,711 55	24,661 96	11,873 55	
49,176 82	49,176 81	59,847 08	77,363 87	90,308 12	89,263 29	
59,104 97	80,157 11	74,860 00	74,831 55	65,008 22	53,124 00	
854,556 51	789,842 67	713,946 39	621,881 81	637,511 28	724,749 96	
23,904 88	19,103 20	19,253 86	7,069 31	10,901 73	18,863 42	
10,308 36	18,020 24	7,690 73	3,511 94	2,280 12		
8,711 38	6,421 08	1,002 62	6,130 23	1,730 24	1,898 10	
42,924 62	43,544 52	18,947 21	16,651 48	14,912 09	20,761 52	
2,212,615 16	1,976,791 51	1,986,712 46	1,857,878 46	2,286,608 38	2,798,539 48	
227 64	2,610 26	611 40	871 02	1,339 17	1,375 00	
227 64	2,610 26	611 40	871 02	1,339 17	1,375 00	
2,212,842 80	1,979,401 77	1,987,323 86	1,858,749 48	2,287,947 55	2,799,914 48	
350,237 62	270,572 80	282,655 11	279,625 17	324,104 37	348,766 42	
407,839 19	306,842 77	296,133 96	334,074 79	334,158 24	391,240 39	
114,673 11	84,954 64	97,941 06	94,062 84	86,606 03	115,055 48	
352,067 84	243,106 82	282,084 49	276,374 43	409,594 33	430,141 58	
58,806 29	75,808 96	78,682 32	82,374 27	80,281 56	89,752 69	
a81,607 08	a89,631 03	a88,279 40	a101,659 38	98,068 44	a92,010 79	
f80,131 58	g24,890 47	n1,957 12	i1,228 43	a1 30	a957 75	
a1,090 56	a1,722 25	a41 00	a1,429 66		a58,054 12	
p15,161 31	q16,489 92	r13,513 28	s7,776 27	a6,642 54	a7,986 15	
1,441,614 52	1,114,019 66	1,147,287 74	1,178,605 24	1,339,456 81	1,533,965 37	
771,228 28	865,382 11	840,036 12	680,144 24	948,490 74	1,265,949 11	\$6,708,314 81
38,561 41	43,269 11	42,001 81	34,007 21	47,424 54	63,297 46	
378,180 00	378,180 00	378,180 00	378,180 00	378,180 00	378,180 00	
56,236 40		18,994 69	19,486 78	10,141 66	36,895 00	
		31,199 85	36,872 55	48,217 95	51,054 30	
					16,938 47	
434,416 40	378,180 00	428,374 54	434,539 33	436,539 61	483,067 77	
336,811 88	487,202 11	411,661 58	245,604 91	511,951 13	782,881 34	
38,561 41	43,269 11	42,001 81	34,007 21	47,424 54	63,297 46	\$335,415 75

f 1/11 of \$102,712.07. g 1/11 of \$12,515.95. h 1/11 of \$8,467.37. i 1/11 of \$1,729.55. j 1/11 of \$76,738.35.
 \$30,330.96. p 70% of \$21,639.02. q 70% of \$23,490.38. r 70% of \$19,304.69. s 70% of \$11,108.96.

STATEMENT b.—Apportionment of construction expenses for years ending Nov

Accounts.	1869.				1870.			
	Total.	Between mile-posts 0-394.	Not ascer-tained.	Outside of mile-posts 0-394.	Total.	Between mile-posts 0-394.	Not ascer-tained.	Outside of mile-posts 0-394.
Ballast.....					\$6,231 64	\$5,143 77		\$1,087 87
Bridge and culvert masonry.....	\$751 25	\$751 25			23,400 77	21,643 27	\$1,834 00	13 50
Bridge superstruct. and trestles.....	7,385 90	7,385 90			17,508 37	16,557 61	314 02	636 74
Buildings:								
Mach. shops, eng. houses, &c.....	2,029 28	846 28		\$1,183 00	134,537 24	82,663 33	44,679 99	7,193 92
Car shops and sheds.....					29,450 14	881 85	28,568 29	
Stations and warehouses.....	7,377 77	1,197 50	\$3,102 56	3,077 71	43,770 80	40,883 23	1,205 36	1,691 21
Section and tool houses.....	5,726 51	5,579 51	147 00		44,377 84	39,594 16	4,610 23	164 45
Fuel and water stations.....	7,150 20	5,638 78	1,378 12	142 30	95,757 36	52,353 74	14,588 50	28,815 03
Fuel stations.....								
Water stations.....								
Hotels and eating houses.....								
Cattle-guards.....								
Chairs, spikes, frogs, switches, &c.....	670 26	670 26			18,491 65	12,361 91	2,800 85	3,329 39
Chairs and spikes.....								
Frogs and switches.....					15,268 87	12,919 10	1,774 20	575 57
Cross-ties.....	799 47	799 47						
Ditching.....	471 77	471 77			5,573 09	2,840 85	2,732 24	
Engineering.....								
Fencing.....								
Fish-bars, bolts, &c.....	696 03	696 03			66,650 67	61,086 91	3,897 71	1,675 05
Graduation.....	80,047 04	3,976 87	4,571 30	72,398 87	24,170 21	6,661 90	94 26	17,414 05
Incidentals.....					46,309 86	46,309 86		
Iron rails.....	3,327 60	3,327 60			22,429 69	14,486 24	4,038 81	3,904 64
Laying and surfacing track.....								
Road crossings.....	2,766 40	1,029 10		1,737 30	1,639 75	1,463 75		176 00
Right of way.....								
Snow-fencing.....								
Stock yards.....	9,095 04	380 06		9,314 38	7,629 53			7,629 53
Surveys.....	1,484 02			1,484 02	824 40			
Telegraph.....								
Total.....	131,287 54	32,750 98	9,198 08	89,337 58	604,129 88	418,675 88	111,323 05	74,130 95
Accounts.	1874.				1875.			
	Total.	Between mile-posts 0-394.	Not ascer-tained.	Outside of mile-posts 0-394.	Total.	Between mile-posts 0-394.	Not ascer-tained.	Outside of mile-posts 0-394.
Buildings:								
Stations and warehouses.....	10,138 20	2,093 32		8,044 88	3,330 90	330 00		3,000 90
Section and tool houses.....	1,771 96			1,771 96	480 74			480 74
Water stations.....	3,465 61	1,332 38		2,133 28				
Fuel stations.....	952 57	332 61		619 96				
Chairs and spikes.....	615 07	615 07						
Cross-ties.....	3,178 97	3,178 97						
Engineering.....								
Frogs and switches.....	473 10	473 10						
Graduation.....					1,451 11	1,451 11		
Iron rails.....	13,064 26	12,299 84		764 42				
Laying and surfacing track.....	1,442 70	1,442 70						
Right of way.....	1,865 75	1,355 00		510 75	3,113 62	1,146 89		1,966 73
Snow-fencing.....	5,036 90			5,036 90				
Stock-yards.....	510 88	510 88						
Surveys.....					91 00			91 00
Total.....	42,515 95	23,633 80		18,862 15	8,467 37	2,928 00		5,539 37

SUM

	1869.	1870.	1871.
Between mile-posts 0-394.....	\$32,750 98	\$418,675 88	\$161,211 35
Not ascertained.....	9,198 08	111,323 05	34,064 27
Outside of mile-posts 0-394.....	89,337 58	74,130 95	217,065 29
Total.....	131,287 54	604,129 88	412,280 91

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umber 1, 1869 to 1872, correcting previous statement of the item of "construction."

MARY.

1872.	1873.	1874.	1875.	1876.	1877.	1878.	Total.
\$37,242 50	\$66,311 84	\$23,633 40	\$2,928 00	\$682 55	\$1 30	\$957 75	\$738,395 95
5,979 49	9,260 30						168,826 09
56,261 53	33,179 93	18,882 15	5,559 37	1,412 64	20 00	6,838 10	502,562 54
99,483 52	102,712 07	42,515 95	8,487 37	2,095 19	21 30	7,790 85	1,410,784 58

KANSAS PACIFIC RAILWAY.

STATEMENT c.—*Earnings, expenses, and 5 per cent. of net earnings of subsidized portion (394 miles) of Kansas Pacific Railway by years ending November 1, as corrected by Statement b.*

Year.	Earnings.	Expenses.	Net earnings.	Interest payments to be deducted.	Five per cent. net earnings.
1869	\$2,031,854 86	\$1,266,391 56	\$665,463 30	\$467,930 50	\$33,273 16
1870	2,395,025 65	2,589,857 42	94,006 69	414,383 85	.....
1871	1,918,289 52	1,824,192 83	777,606 72	420,567 45	.....
1872	2,202,704 60	1,425,005 88	771,048 02	424,644 93	38,884 93
1873	2,212,842 80	1,441,794 78	842,065 24	434,416 40	38,552 40
1874	1,979,401 77	1,112,762 99	806,638 78	378,180 00	43,331 94
1875	1,967,323 86	1,145,258 02	690,060 12	428,374 54	42,103 26
1876	1,858,749 48	1,178,058 86	848,490 74	434,539 33	24,034 50
1877	2,287,947 55	1,338,456 81	1,265,949 11	483,067 77	47,424 54
1878	2,799,914 48	1,533,965 37	.....	.....	63,297 46
Total	21,674,054 57	14,956,845 62	6,912,140 72	.....	340,902 20
Less net earnings for 1871.	.....	.....	94,006 69	.....	.....
			6,818,044 03		

KANSAS PACIFIC RAILWAY.

STATEMENT d.—*Gross earnings, working expenses, and net earnings of the Kansas Pacific Railway, as shown by the receivers and the company from November 21, 1876, to December 31, 1879, for 638 miles of road operated—394 miles of road subsidized by the United States, with bonds and lands, and 244 miles of road subsidized, with lands only.*

Division of miles of road operated.	First and second mortgage division, 394 miles.	Third mortgage division, 244 miles.	638 miles.
<i>Gross earnings.</i>			
November 21 to December 31, 1876	\$226,144 53	\$78,224 24	\$304,368 77
January 1 to December 31, 1877	2,395,863 93	791,376 53	3,187,240 46
January 1 to December 31, 1878	2,872,277 98	634,518 55	3,506,796 53
January 1 to December 31, 1879	3,487,517 20	1,078,760 90	4,566,278 10
Total earnings	8,981,803 64	2,582,880 22	11,564,683 86
<i>Working expenses.</i>			
November 21 to December 31, 1876	99,639 80	49,866 02	149,505 82
January 1 to December 31, 1877	1,288,795 47	556,096 74	1,845,892 21
January 1 to December 31, 1878	1,432,225 63	633,975 59	2,066,201 22
January 1 to December 31, 1879	1,829,508 83	702,351 39	2,531,860 22
Total expenses	4,651,169 73	1,942,289 74	6,593,459 47
<i>Net earnings.</i>			
November 21 to December 31, 1876	126,504 73	28,358 22	154,862 95
January 1 to December 31, 1877	1,106,068 46	235,279 79	1,341,348 25
January 1 to December 31, 1878	1,440,052 35	542 96	1,440,595 31
January 1 to December 31, 1879	1,658,008 37	376,409 51	2,034,417 88
Total net earnings	4,330,633 91	640,590 48	4,971,224 39
Percentage of miles operated	61.755	38.245	100
Percentage of gross earnings	77.665	22.335	100
Percentage of working expenses	70.542	29.458	100
Percentage of net earnings	87.114	12.886	100

Memorandum.—The difference between the actual net earnings percentage (87.114) and the mileage percentage (61.755) being 25.359, is equal to an addition to the mileage percentage of 41.06, thus: 25.359 = 41.06, or over 41 per cent.

KANSAS PACIFIC RAILWAY.

Corrected statement "c."—Earnings, expenses, net earnings, and 5 per cent. of net earnings, of the subsidized 394 miles of the Kansas Pacific Railway, from November 2, 1868, to November 1, 1878, by years.

Earnings, expenses, &c.	To November 1, 1869.	To November 1, 1870.	To November 1, 1871.	To November 1, 1872.
Earnings apportioned.....	\$2,031,854 86	\$2,395,025 65	\$1,918,289 52	\$3,202,704 60
Expenses apportioned.....	1,182,977 55	1,579,131 15	1,450,628 99	1,300,894 24
Surplus.....	848,877 31	815,894 50	467,660 53	901,810 36
Add 41.06 per cent.....	348,549 02	335,006 30	192,021 20	370,283 34
Total.....	1,197,426 33	1,150,900 80	659,681 73	1,272,093 70
Less actual expenses, viz:				
Taxes.....	79,011 23	75,831 71	60,990 77	60,800 35
Construction.....	32,750 98	418,675 88	161,211 35	37,242 50
Equipment.....	68,867 75	440,353 56	119,873 06	3,543 28
Real estate.....	2,784 05	61,977 88	14,489 15	1,279 83
Insurance.....		15,162 39	16,999 51	21,245 67
Total.....	183,414 01	1,012,001 42	378,563 84	124,111 64
Net earnings.....	1,014,012 32	138,899 38	286,117 89	1,147,982 06
5 per cent. of net earnings.....	50,700 61			57,399 10
Interest payments.....	441,353 16	493,835 66	415,830 83	419,107 79

Earnings, expenses, &c.	To November 1, 1873.	To November 1, 1874.	To November 1, 1875.	To November 1, 1876.
Earnings apportioned.....	\$2,212,842 80	\$1,979,401 77	\$1,987,323 86	\$1,858,749 48
Expenses apportioned.....	1,283,624 05	981,285 99	1,040,496 94	1,066,511 50
Surplus.....	929,218 75	998,115 78	946,826 92	792,237 98
Add 41.06 per cent.....	381,537 22	409,826 34	388,767 13	325,292 91
Total.....	1,310,755 97	1,407,942 12	1,335,594 05	1,117,530 89
Less actual expenses, viz:				
Taxes.....	81,607 08	89,631 03	88,279 40	101,659 38
Construction.....	60,311 84	23,633 80	2,928 00	682 55
Equipment.....				
Real estate.....	1,090 50	1,722 25	41 00	1,429 96
Insurance.....	15,161 31	16,489 92	13,513 28	7,776 27
Total.....	158,170 73	131,477 00	104,761 68	111,547 86
Net earnings.....	1,152,585 24	1,276,465 12	1,230,832 37	1,005,983 04
5 per cent. of net earnings.....	57,629 26	63,823 25	61,541 61	50,299 15
Interest payments.....	434,416 40	378,180 00	397,174 69	397,666 78

Earnings, expenses, &c.	To November 1, 1877.	To November 1, 1878.	Total for 10 years.	Total 5 per cent.
Earnings apportioned.....	\$3,287,947 55	\$2,799,914 48	\$31,674,054 57	1869... \$50,700 61
Expenses apportioned.....	1,234,744 53	1,374,956 56	12,495,251 50	1870... ..
Surplus.....			9,178,803 07	1871... ..
Add 41.06 per cent.....			2,751,283 46	1872... 57,399 10
Total.....	1,053,203 02	1,424,957 92	11,930,086 53	1873... 57,629 26
Less actual expenses, viz:				1874... 63,823 25
Taxes.....	98,068 44	92,010 79	827,890 18	1875... 61,541 61
Construction.....	1 30	957 75	738,395 95	1876... 50,299 15
Equipment.....		58,654 12	690,691 78	1877... 47,424 54
Real estate.....			84,814 32	1878... 63,297 46
Insurance.....	6,642 54	7,986 15	120,977 04	Total.. 452,114 98
Total.....	104,712 28	159,008 81	2,462,769 27	
Net earnings.....	948,490 74	1,265,949 11	9,467,317 26	
5 per cent. of net earnings.....	47,424 54	63,297 46	452,114 98	
Interest payments.....	388,321 66	415,075 00	4,180,961 97	

SIOUX CITY AND PACIFIC RAILROAD.

Statement of the earnings, expenses, and net earnings, from November 1, 1874, to June 30, 1880, of 101.77 miles, subsidized by the issue of United States bonds, of the Sioux City and Pacific Railroad.

	November 1 to December 31, 1874.	January 1 to June 30, 1875.	July 1, 1875, to June 30, 1876.	July 1, 1876, to June 30, 1877.	July 1, 1877, to June 30, 1878.	July 1, 1878, to June 30, 1879.	July 1, 1879, to June 30, 1880.
EARNINGS.							
Freight.....	\$31,405 96	\$70,124 99	\$201,998 59	\$208,746 75	\$271,732 99	\$254,719 79	\$328,276 89
Passenger.....	12,408 76	33,282 82	81,423 04	89,864 83	84,872 75	87,779 01	105,783 03
Mail.....	1,216 66	3,650 02	11,175 86	9,635 92	9,422 90	8,255 88	10,189 93
Express.....	1,165 53	8,897 24	2,067 83	2,784 71	2,436 00	3,012 01	3,940 50
Car service.....	771 19	2,543 81	2,155 25	406 42	1,139 36	1,139 50	1,104 51
Miscellaneous.....	1,229 02	3,143 33	9,155 52	5,830 21	5,741 30	5,546 05	6,144 97
Total.....	47,197 12	113,622 21	308,006 18	317,288 84	375,069 10	390,452 24	455,440 23
Loss 7.29 per cent. earnings of Iowa division.....	2,443 08	6,016 85	15,082 47	16,286 27	17,694 42	17,423 48	21,142 85
Total earnings.....	44,754 04	107,605 36	292,923 71	301,002 57	357,374 68	343,028 76	434,297 38
EXPENSES.							
Station service.....	2,229 69	6,255 81	12,491 03	11,899 27	12,027 28	12,301 95	14,533 32
Station expenses, except labor.....	228 34	4,409 57	1,109 31	1,980 15	960 38	1,069 46	1,332 19
Conductors, baggage-men, and brakemen.....	1,881 85	4,855 38	12,076 53	12,515 70	13,422 90	12,790 20	15,321 17
Townships.....	456 07	6,682 69	1,758 27	1,810 24	1,669 74	1,563 64	1,823 49
Tools, printing, and stationery.....	285 77	1,022 21	2,077 69	1,675 69	1,862 04	1,577 56	2,156 90
Advertising.....	8 46	175 51	205 82	96 94	102 10	368 15	167 75
Tineries to individuals.....		500 00	1,000 48	50 00	21,186 00	347 01	1,223 10
Loss and damage, freight.....	3 89	40 25	770 85	64 33	230 52	34 66	2,782 15
Miscellaneous loss and damage.....	11 00	455 99	3,167 86	2,288 96	1,168 90	1,010 42	2,023 56
Watchmen.....	217 30	427 03	860 00	862 50	790 00	705 00	781 11
Engineers, firemen, and wipers.....	2,710 09	6,738 89	10,225 72	14,730 59	14,716 39	14,091 40	17,111 05
Repairs of locomotives.....	1,532 79	6,672 16	15,795 41	12,844 92	10,678 13	12,580 11	14,981 62
Oil, tallow, and waste for locomotives.....	218 60	482 13	1,080 19	1,211 33	1,287 20	1,221 61	1,446 67
Fuel for locomotives.....	3,403 48	7,920 59	22,036 83	23,897 15	25,178 02	22,297 57	26,518 52
Car service.....	1,623 57	1,480 96	1,714 67	2,237 02	2,954 69	3,818 70	13,500 46
Repairs of cars.....	1,704 46	6,201 27	15,475 86	14,742 60	12,201 09	12,576 79	13,556 12
Oil, tallow, and waste for cars.....	56 79	109 94	431 35	423 42	449 91	242 58	348 90
Fuel for shops and engine-houses.....	282 45	694 99	834 90	794 62	431 00	418 16	307 56
Shop and engine-house expense.....	3 79	45 23	284 81	487 05	389 38	351 82	805 10
Pumpers, wood-pilers, and coal-heavers.....	407 34	1,079 58	2,130 06	1,856 55	1,813 83	2,049 69	2,534 03
Expenses of water and fuel stations, except labor.....	24 42	80 03	145 09	106 73	94 72	72 49	67 79
Repairs of water tanks and fuel sheds.....	240 30	757 03	1,026 82	971 05	890 50	914 70	2,083 65
Repairs of roadway and track.....	2,824 72	8,787 99	19,330 78	18,762 59	26,284 77	24,156 77	16,352 37

Renewal of track.....	1,008 02	7,910 47	19,704 83	32,535 83	33,119 82	33,585 75	46,154 48
Removing snow, ice, and weeds.....	88 96	1,053 77	4,608 71	6,378 49	7,285 36	7,319 35	9,452 81
Repairs of bridges.....	364 66	2,701 15	6,523 60	8,918 20	14,084 96	24,236 89	19,188 62
Repairs of fences.....	16 80	1 89	710 70	1,106 50	1,253 85	2,490 58	1,868 75
Repairs of buildings.....	398 60	1,102 27	3,240 88	7,877 25	7,838 23	2,833 00	6,632 18
Repairs of docks and levees.....	5,550 86	1,560 16	15,106 28	11,724 23	15,966 55	15,625 23	17,477 74
Expenses of Sioux City and Pacific Ferry.....	6,287 52	10,461 63	20,745 63	19,491 04	20,338 29	15,005 60	26,239 13
Repairs of steamers and barges.....	131 71	10,461 63	24,806 74	1,121 46	383 56	1,844 36	2,644 06
General expenses.....	2,184 72	7,322 41	13,185 66	12,559 84	13,446 50	11,900 49	10,251 14
Legal expenses.....	186 67	470 51	578 24	3,596 62	2,543 71	822 39	614 26
Taxes, State, county, and city.....		12,227 29	20,575 77	10,619 56	17,574 17	12,365 12	13,051 51
Insurance.....					1,470 00	1,450 00	1,472 85
Total.....	38,497 91	93,035 40	262,821 81	238,683 56	277,423 39	251,914 19	290,268 92
Construction items.....	1,385 59	647 77	551 16	2,480 98	6,304 44	12,454 94	5,413 54
Total.....	39,753 50	93,683 17	263,352 97	241,174 54	298,727 83	264,369 13	304,702 46
Less 7.25 per cent. expenses Iowa division*.....	1,340 05	4,807 36	10,623 65	11,668 74	13,558 08	12,425 72	13,664 74
Total expenses.....	38,413 45	88,875 81	252,529 34	229,475 80	275,169 75	251,943 41	291,637 72
NET EARNINGS.							
Total.....	6,340 59	18,729 55	40,394 37	71,528 77	84,204 93	91,085 35	142,659 46
Interest on first mortgage bonds.....							
Five per cent. net earnings.....	16,280 00	48,840 00	97,680 00	97,680 00	97,680 00	97,680 00	97,680 00
							7,132 97

* Iowa division: subsidized 74.25 miles; unsubsidized 5.84 miles = 7.25 per cent. † Two-twelfths, 1874.

Statement of earnings, expenses, net earnings, and 5 per cent. of net earnings of Central Branch Union Pacific Railroad for year ending December 31, 1878.

Earnings: January 1, to June 30, 1878	\$258, 108 60	
Expenses: January 1, to June 30, 1878	175, 878 78	
Net earnings 157.35 miles	52, 229 82	
Of which 100 miles $\frac{149}{157.35} =$		\$52, 259 37
Earnings: July 1, to December 31, 1878	366, 845 17	
Expenses: July 1, to December 31, 1878	208, 816 60	
Net earnings 183.16 miles	158, 028 57	
Of which 100 miles $\frac{149}{183.16} =$		86, 278 90
Total net earnings 100 miles		138, 538 27
Of which 5 per cent. = amount retained by the United States..		6, 926 91

APPENDIX R.

SINKING FUND OF THE UNION AND CENTRAL PACIFIC RAILROAD COMPANIES HELD IN THE TREASURY OF THE UNITED STATES.

Statement in detail of the sinking funds of the Union and Central Pacific Railroad Companies, from July 1, 1879, to June 30, 1880.

UNION PACIFIC.

Kind of service, &c.	Date of service.	When covered into the Treasury.	Interest on sinking-fund bonds.		Amount.	United States bonds invested in—	Date of purchase.	Premium paid.		Total amount paid.
			Amount of bonds.	Amount of interest.				Rate.	Premium.	
Am't brought forward from statement on page 232. Report for 1879.		1879.	\$59,500 00	\$743 75	\$201,553 61				\$8,116 25	\$201,510 25
Mail	Apr. 1 to June 30, 1879	Aug. 22			47,108 07					
Interior	Apr. 1 to June 30, 1879	Aug. 22			77 50					
Interior	Apr. 1 to June 30, 1879	Aug. 22			39 00					
Interior	Apr. 1 to June 30, 1879	Aug. 22			38 75					
Interior	Apr. 1 to June 30, 1879	Aug. 22			345 80					
Interior	Apr. 1 to June 30, 1879	Aug. 22			46 50					
Interior	Apr. 1 to June 30, 1879	Aug. 22			77 50		1879			
Interior	Aug. 22. Three months' interest	Aug. 22	183,400 00	2,417 50	2,417 50	Five per cent. funded loan of 1881.	Sept. 2	2	984 00	50,184 00
Interior	Not given	Sept. 24		3,161 25	251,704 23				9,100 25	251,700 25
War	{ Dec. 1878 to Mar. 1879 Nov. to Dec., 1878 }	{ Sept. 24 Sept. 24 }			14,175 24				380 87	14,230 87
Interior	Not given	Oct. 27		3,161 25	265,963 02				9,481 12	265,981 12
Interior	Not given	Oct. 27			15 50					
Interior	Not given	Oct. 27			38 75					
Interior	Not given	Oct. 27			38 75					
War	Mar. 1879	Nov. 26			303 48					
War	June 9, 1879	Nov. 26			9 08					
War	Three months' interest	Nov. 26	258,450 00	3,205 62	27 08					
Interior	Not given	Dec. 22		3,205 62	3,205 62					

Statement in detail of the sinking funds of the Union and Central Pacific Railroad Companies, &c.—Continued.

UNION PACIFIC—Continued.

Kind of service, &c.	Date of service.	When covered into the Treasury.	Interest on sinking-fund bonds.		Amount.	United States bonds invested in—	Date of purchase.	Principal.	Premium paid.		Total amount paid.
			Amount of bonds.	Amount of interest.					Rate.	Premium.	
Interior.....	Not given.....	1879.			\$23 25						
War.....	May, 1879.....	Dec. 22			77 00						
Treasury.....	Apr., May, and June, 1879.....	Dec. 22			162 00						
War.....	Mar. 27 to Apr. 30, 1879.....	1880.			1,309 48						
War.....	June and July, 1879.....	Jan. 28			10 14						
War.....	July and Sept., 1878.....	Jan. 28			17,866 31						
War.....	May, 1879.....	Jan. 28			4 85						
War.....	Mar., May, and June, 1879.....	Jan. 28			12 28						
War.....	Apr., 1879.....	Jan. 28			2 03						
War.....	July and Aug., 1879.....	Jan. 28			13 81						
War.....	Sept. and Oct., 1879.....	Feb. 27			2 26						
War.....	Aug. 5 to Oct., 1879.....	Feb. 27			3,882 30						
War.....	Oct., 1879.....	Feb. 27			21,148 43						
War.....	Apr., May, and June, 1879.....	Feb. 27			6,005 67						
War.....	July and Aug., 1879.....	Feb. 27			13,866 85						
War.....	Oct. and Nov., 1879.....	Feb. 27			277 48						
War.....	Sept. and Oct., 1879.....	Feb. 27			8,088 25						
War.....	Nov., 1879.....	Feb. 27			39 00						
War.....	Dec., 1879.....	Feb. 27			54 00						
War.....	Nov., 1879.....	Feb. 27			3,205 62						
War.....	Sept. and Oct., 1879.....	Mar. 25			108 50						
War.....	Jan., 1880.....	Mar. 25			255 75						
War.....	Jan. and Feb., 1879.....	Mar. 25			131 75						
War.....	Sept. and Dec., 1878.....	Apr. 26			2,795 49						
War.....	Dec., 1878, to Feb., 1879.....	Apr. 26			1,206 41						
War.....	Sept. and Oct., 1878.....	Apr. 26			9,659 30						
War.....	Feb., 1879.....	Apr. 26			5,418 82						
War.....	Feb. and Mar., 1879.....	Apr. 26			06						
War.....	Dec., 1878, to Feb., 1879.....	Apr. 26			6,804 19						
War.....	Sept. and Oct., 1879.....	Apr. 26			6,696 94						
War.....	Feb. to Sept., 1879.....	Apr. 26			27 80						
War.....	July to Dec., 1878.....	Apr. 26			5,025 00						
War.....	.....	Apr. 26			14,365 42						

[illegible]

CENTRAL PACIFIC.

[illegible]

Statement in detail of the sinking funds of the Union and Central Pacific Railroad Companies, &c.—Continued.

CENTRAL PACIFIC—Continued.

Kind of service, &c.	Date of service.	When covered into the Treasury.	Interest on sinking-fund bonds.		Amounts.	United States bonds invested in—	Date of purchase.	Principal.	Premium paid.		Total amount paid.
			Amount of bonds.	Amount of interest.					Rate.	Premium.	
War	July, 1878	1879			\$2,392 31		1879.				
War	Oct. 18 to Nov. 16, 1878	Sept. 24			46 00		Sept. 27	\$30,250 00	33	\$631 87	\$31,081 87
Interior	Not given	Oct. 27		\$1,976 87	201,748 46			194,900 00		6,807 83	201,707 83
Interior	Not given	Oct. 27			21 80						
Interior	Not given	Oct. 27			39 87						
Interior	Not given	Oct. 27			31 25						
Interior	Not given	Oct. 27			34 50						
Interior	Not given	Oct. 27			11 50						
Cash payment by company		Nov. 26			181,329 51						
	(Three months' interest)	Nov. 26	\$194,900 00	2,436 23	2,436 23						
War	May 26, 1879	1880			23 00						
War	July 6, 1879	Jan. 28			23 00						
Navy	Not given	Jan. 28			3 01						
Treasury		Feb. 27			23 00						
	(Three months' interest)	Feb. 27	194,900 00	2,436 23	2,436 23						
Interior	Oct., 1879 (interest)	Mar. 25			23 82						
Interior	Nov. and Dec., 1879	Mar. 25			29 82						
War	Apr. and May, 1879	Apr. 26			2,921 82						
War	Apr. 1879 to May, 1879	Apr. 26			17,231 32						
War	July, 1879 to Sept., 1879	Apr. 26			11,253 45						
War	June 4, A. 1879	Apr. 26			7,807 55						
Interior	Aug. and Sept., 1879	Apr. 26			29 75						
Navy	Apr. and Sept., 1879	Apr. 26			19 73						
Interior	Jan. and Feb., 1880	May 26			68 00		1880.				
						Four per cent. funded loan of 1907.	June 17	197,350 00	73	15,294 02	212,644 02
War	Jan. 8, 1880	June 26		6,849 37	414,378 12						
War	July 1, 1878 to June 30, 1879	June 26			20 61			392,350 00		22,102 45	414,352 45
War	Dec., 1878	June 26			25,944 28						
War		June 26			14 00						

War	Mar., May, and June 1879	June 26	1,450 75
War	July, 1878, to June, 1879	June 26	538 56
War	Sept. 1878	June 26	15 44
Interior	Apr., 1880	June 26	35 03
Interior	July 1 to Sept. 30, 1878	June 26	18 56
Mail	Oct. 1 to Dec. 31, 1878	June 26	121 68
Mail	Jan. 1 to Mar. 31, 1879	June 26	121 68
Mail	Apr. 1 to June 30, 1879	June 26	121 08
Mail	July 1 to Sept. 30, 1879	June 26	42,400 08
Mail	Oct. 1 to Dec. 31, 1879	June 26	42,391 74
Mail	Jan. 1 to Mar. 31, 1880	June 26	39,884 92
Mail	(Three months' interest)	June 26	2,436 25
			194,900 00
			9,285 62
			569,487 37
			392,250 00
			22,102 45
			580,487 37
			155,134 92
			Balance uninvested

APPENDIX S.

BUSINESS OF RAILROADS EAST AND WEST OF THE MISSISSIPPI RIVER (COMPILED FROM
"POOR'S MANUAL" AND OTHER SOURCES).

APPENDIX S.—SCHEDULE a.

Miles operated.

WESTERN RAILROADS.

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	649	649	650	678	678	678	787
Chicago, Burlington and Quincy	1,236	1,268	1,272	1,339	1,620	1,624	1,783
Chicago and Northwestern	1,706	1,923	1,990	1,992	1,993	2,037	2,129
Chicago, Rock Island and Pacific	674	674	674	677	707	1,003	1,125
Illinois Central	1,108	1,108	1,108	1,108	1,108	1,256	1,256
Hannibal and Saint Joseph	292	292	292	292	292	292	292
International and Great Northern	384	446	459	459	519	519	519
Union Pacific	1,039	1,039	1,039	1,039	1,039	1,039	1,039
Atchison, Topeka and Santa Fé	509	509	540	711	738	807	997
Kansas Pacific	673	673	673	673	673	673	673
Central Pacific	1,254	1,266	1,349	1,424	1,906	2,119	2,319
Total	9,524	9,847	10,046	10,392	11,273	12,047	12,919

EASTERN RAILROADS.

Maine Central	355	355	355	355	355	355	355
Cheshire	88	88	64	64	64	64	64
Boston and Albany	293	318	318	322	322	322	322
Boston and Maine	190	192	203	203	203	203	203
Boston and Providence	67	67	67	67	67	67	68
Eastern (Massachusetts)	265	282	282	282	282	282	282
Fitchburg	93	152	152	152	152	152	152
New York and New England	139	139	139	139	139	153	285
Old Colony	257	265	265	269	290	302	454
Hartford, Providence and Fishkill	130	130	133	133	133	133	(*)
New Haven and Northampton	109	109	109	109	109	109	109
New London and Northern	100	100	100	100	100	100	100
New York, New Haven and Hartford	140	152	152	152	152	152	152
Buffalo, New York and Philadelphia	121	121	121	121	121	121	121
New York Central and Hudson River	858	1,000	1,000	1,000	1,000	1,018	1,018
New York, Lake Erie and Western	950	959	942	957	957	928	928
Ogdensburg and Lake Champlain	122	122	122	122	122	122	122
Rome, Watertown and Ogdensburg	218	218	270	336	409	409	409
Troy and Boston	53	53	53	53	53	53	46
Utica and Black River	113	135	148	170	170	170	180
Central of New Jersey	275	329	365	365	385	385	396
United New Jersey	276	293	293	293	373	373	426
West Jersey	128	128	128	128	128	128	128
Allegheny Valley	200	200	259	259	259	259	259
Northern Central	313	317	322	322	322	322	322
Pennsylvania	869	877	904	963	1,055	1,055	1,093
Philadelphia and Erie	287	287	287	287	287	287	287
Philadelphia, Wilmington and Baltimore	101	101	101	101	112	112	112
Baltimore and Potomac	90	90	90	90	90	90	90
Atlantic, Mississippi and Ohio	428	428	428	428	428	428	428
Chesapeake and Ohio	318	433	433	433	433	435	437
Atlantic and Great Western	605	605	563	512	512	512	512
Cleveland, Columbus, Cincinnati and Indianapolis	472	472	472	472	472	472	472
Cleveland and Pittsburgh	226	226	226	226	226	226	226
Lake Shore and Michigan Southern	1,154	1,175	1,175	1,177	1,177	1,177	1,177
Marquette, Houghton and Ontonagon	84	89	89	89	89	89	89
Philadelphia and Reading	725	725	800	799	799	799	892
Total	11,212	11,732	11,930	12,050	12,347	12,364	12,716
Grand total	20,736	21,579	21,976	22,442	23,620	24,411	25,635

* Consolidated with New York and New England.

APPENDIX S.—SCHEDULE b.

Passengers carried.

WESTERN RAILROADS.

[Numbers are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	839	904	862	873	860	781	843
Chicago, Burlington and Quincy	1,706	1,830	2,019	2,393	2,181	2,187	2,421
Chicago and Northwestern	2,479	2,823	3,407	3,527	3,347	3,416	3,328
Chicago, Rock Island and Pacific	956	1,088	1,245	1,406	1,455	1,552	1,501
Illinois Central	1,472	1,587	1,648	1,815	1,711	1,725	1,808
Hannibal and Saint Joseph	242	231	221	249	239	257	282
International and Great Northern	74	95	96	111	127	117	113
Union Pacific	174	188	209	202	185	188	217
Atchison, Topeka and Santa Fe	78	69	72	133	165	217	314
Kansas Pacific	173	138	123	124	143	198	280
Central Pacific	3,280	3,862	4,762	5,772	6,820	6,979	6,842
Total	11,463	12,815	14,664	16,605	17,233	17,617	17,949

EASTERN RAILROADS.

Maine Central	719	752	672	693	611	565	553
Cheshire	198	177	161	141	127	124	125
Boston and Albany	5,757	5,889	5,964	5,578	5,293	5,200	5,199
Boston and Maine	5,008	4,749	4,906	5,086	4,442	4,564	4,672
Boston and Providence	3,741	3,486	3,524	3,475	3,197	3,213	3,206
Eastern (Massachusetts)	5,696	6,019	5,386	4,796	4,978	4,197	4,535
Fitchburg	1,881	2,236	2,536	2,293	2,149	2,166	2,227
New York and New England	1,723	1,774	1,729	1,794	1,608	1,731	2,664
Old Colony	4,088	4,375	4,286	4,150	4,005	3,959	4,620
Hartford, Providence and Fishkill	176	174	173	190	232	222	(*)
New Haven and Northampton	390	372	383	306	275	268	279
New London and Northern	324	280	286	355	301	281	251
New York, New Haven and Hartford	3,892	3,926	4,034	3,912	3,564	3,525	3,588
Buffalo, New York and Philadelphia	234	234	229	207	138	189	207
New York Central and Hudson River	7,630	9,878	9,422	9,281	8,919	8,927	8,131
New York, Lake Erie and Western	3,922	4,223	5,052	5,042	4,897	4,896	4,896
Ogdensburg and Lake Champlain	156	142	132	131	118	115	104
Rome, Watertown and Ogdensburg	484	390	564	592	674	576	515
Troy and Boston	295	250	246	285	301	294	278
Utica and Black River	209	229	245	245	221	218	213
Central of New Jersey	4,401	4,614	4,456	4,922	4,877	4,505	4,973
United New Jersey	8,008	7,837	7,846	10,292	7,384	7,127	7,205
West Jersey	710	621	656	737	606	613	660
Allegheny Valley	861	831	694	791	968	875	787
Northern Central	1,180	1,347	1,568	1,903	1,479	1,880	1,531
Pennsylvania	5,879	6,088	5,609	6,926	5,129	5,205	5,949
Philadelphia and Erie	777	690	612	691	493	459	449
Philadelphia, Wilmington and Baltimore	2,381	2,181	2,152	2,818	2,115	2,243	2,371
Baltimore and Potomac	780	783	1,030	1,133	881	909	896
Atlantic, Mississippi and Ohio	245	208	188	213	151	149	129
Chesapeake and Ohio	220	221	188	169	160	172	166
Atlantic and Great Western	975	1,038	964	919	833	919	963
Cleveland, Columbus, Cincinnati and Indianapolis	543	668	780	800	695	695	740
Cleveland and Pittsburgh	703	664	655	635	508	584	695
Lake Shore and Michigan Southern	2,845	3,096	3,170	3,119	2,742	2,746	2,822
Marquette, Houghton and Ontonagon	174	119	87	71	69	59	66
Philadelphia and Reading	6,790	6,964	6,938	10,936	6,674	6,376	7,909
Total	81,993	87,515	87,473	95,657	81,305	80,246	84,473
Grand total	93,456	100,330	102,137	112,262	98,538	97,863	102,422

* Consolidated with New York and New England.

APPENDIX S.—SCHEDULE C.

Passenger mileage.

WESTERN RAILROADS.

[Numbers are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	38,423	41,865	39,913	41,231	40,743	37,797	54,219
Chicago, Burlington and Quincy	83,275	85,356	93,770	99,238	93,806	93,087	113,667
Chicago and Northwestern	111,071	109,134	116,779	122,281	116,902	118,877	116,088
Chicago, Rock Island and Pacific	42,382	49,186	54,804	59,393	60,634	62,096	63,312
Illinois Central	48,503	51,115	50,828	51,238	46,076	43,849	44,567
Hannibal and Saint Joseph	17,140	14,836	13,674	15,191	15,699	19,108	21,546
International and Great Northern	4,535	6,545	7,306	7,883	9,008	7,841	7,635
Union Pacific	95,709	105,138	132,591	128,032	107,833	96,304	100,151
Atchison, Topeka and Santa Fe	0,836	7,597	7,166	17,031	22,008	31,921	44,351
Kansas Pacific	23,589	22,035	19,292	18,232	18,936	22,173	25,674
Central Pacific	120,858	134,318	168,336	172,639	181,715	178,773	178,773
Total	592,321	627,115	704,359	732,389	712,800	711,628	784,572

EASTERN RAILROADS.

Maine Central	27,622	27,666	25,684	25,208	22,740	20,449	20,441
Cheshire	6,325	5,968	5,250	4,458	4,038	3,948	3,974
Boston and Albany	120,662	122,063	119,720	110,644	103,278	101,231	101,248
Boston and Maine	61,760	75,061	65,123	67,897	61,779	64,292	64,975
Boston and Providence	41,224	38,625	38,743	37,948	35,965	37,557	37,960
Eastern (Massachusetts)	75,789	85,730	75,201	69,453	68,502	61,706	65,403
Fitchburg	25,706	29,304	31,092	29,537	30,690	32,266	35,094
New York and New England	16,857	18,382	18,607	20,199	19,652	23,260	30,150
Old Colony	61,090	63,673	61,295	59,025	50,628	58,845	72,605
Hartford, Providence and Fishkill	16,238	14,732	15,013	16,116	15,476	14,191	(*)
New Haven and Northampton	5,373	5,526	4,926	4,626	4,516	5,455	4,728
New London and Northern	4,834	4,172	4,526	5,899	5,941	4,765	3,928
New York, New Haven and Hartford	122,604	123,895	123,008	123,866	111,641	105,458	103,113
Buffalo, New York and Philadelphia	4,903	5,685	5,669	4,606	2,764	3,823	4,164
New York Central and Hudson River	339,122	350,781	338,934	353,136	316,847	300,202	290,953
New York, Lake Erie and Western	164,633	160,204	155,896	168,074	170,888	140,326	149,116
Ogdensburg and Lake Champlain	4,999	4,430	4,234	4,585	3,485	3,360	3,646
Rome, Watertown and Ogdensburg	14,657	14,120	14,205	15,588	17,549	15,199	20,517
Troy and Boston	5,318	4,911	4,696	5,605	6,660	6,402	6,113
Utica and Black River	4,509	4,868	5,593	5,792	5,396	5,266	5,222
Central of New Jersey	48,448	50,739	49,861	60,287	56,181	58,307	63,118
United New Jersey	167,505	165,486	162,225	302,188	143,132	189,245	146,914
West Jersey	19,107	17,537	16,290	19,411	14,523	15,396	16,674
Allegheny Valley	13,515	17,183	12,448	14,939	19,833	15,874	13,763
Northern Central	29,464	29,858	29,629	43,401	27,726	24,122	26,880
Pennsylvania	177,479	174,959	160,422	288,312	143,153	142,036	155,784
Philadelphia and Erie	20,257	17,148	15,117	22,425	12,466	11,444	11,563
Philadelphia, Wilmington, and Baltimore	64,250	67,677	65,634	104,810	59,160	69,504	62,103
Baltimore and Potomac	7,627	11,819	16,804	17,237	11,684	12,277	13,299
Atlantic, Mississippi, and Ohio	12,656	10,894	10,671	10,616	9,531	9,470	8,080
Chesapeake and Ohio	10,680	11,552	11,182	9,737	8,910	9,269	9,811
Atlantic and Great Western	37,903	39,466	36,962	36,626	33,628	37,242	41,226
Cleveland, Columbus, Cincinnati and Indianapolis	27,623	28,951	30,497	36,042	29,066	29,470	34,072
Cleveland and Pittsburgh	21,571	19,075	17,611	19,844	15,640	14,853	16,624
Lake Shore and Michigan Southern	179,363	173,224	164,550	175,510	138,116	133,702	141,162
Marquette, Houghton, and Ontonagon	2,788	1,818	1,886	1,208	1,170	1,030	1,131
Philadelphia and Reading	80,057	79,265	76,556	123,871	74,815	75,110	96,963
Total	2,044,513	2,066,378	1,996,195	2,413,626	1,856,589	1,806,440	1,889,776
Grand total	2,636,834	2,693,493	2,700,554	3,146,015	2,569,389	2,518,268	2,674,348

* Consolidated with New York and New England.

APPENDIX 8.—SCHEDULE d.

Passenger earnings.

WESTERN RAILROADS.

[Amounts are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	\$1,379	\$1,420	\$1,252	\$1,218	\$1,211	\$1,071	\$1,312
Chicago, Burlington and Quincy	2,576	2,608	2,677	2,654	2,483	2,430	2,567
Chicago and Northwestern	3,509	3,426	3,205	3,145	3,018	2,978	3,241
Chicago, Rock Island and Pacific	1,521	1,660	1,677	1,763	1,179	1,646	1,888
Illinois Central	1,260	1,212	1,230	1,184	1,087	986	943
Hannibal and Saint Joseph	650	601	522	565	524	549	597
International and Great Northern	215	283	279	289	347	818	810
Union Pacific	3,887	3,952	4,346	4,807	3,599	3,150	3,266
Atchison, Topeka and Santa Fé	945	341	337	715	738	967	1,853
Kansas Pacific	1,242	1,111	933	766	690	782	1,126
Central Pacific	4,418	4,723	5,509	5,589	5,484	5,285	4,919
Total	21,002	21,346	21,967	22,115	20,303	20,341	21,429

EASTERN RAILROADS.

Maine Central	\$916	\$910	\$797	\$769	\$688	\$623	\$610
Cheshire	209	207	180	155	132	129	134
Boston and Albany	3,011	3,015	2,672	2,626	2,886	2,375	2,108
Boston and Maine	1,302	1,410	1,371	1,249	1,355	1,300	1,297
Boston and Providence	949	903	897	1,830	1,800	1,294	926
Boston (Massachusetts)	1,392	1,772	1,662	1,400	1,394	1,378	1,841
Pitchburg	536	644	606	622	634	644	638
New York and New England	384	393	408	443	421	428	788
Old Colony	1,431	1,456	1,372	1,210	1,232	1,247	1,494
Hartford, Providence and Fishkill	534	487	485	470	414	381	(*)
New Haven and Northampton	168	164	181	187	156	127	125
New London and Northern	204	184	181	205	157	160	162
New York, New Haven and Hartford	2,843	2,877	2,885	2,787	2,321	2,241	2,151
Buffalo, New York and Philadelphia	181	149	139	126	97	134	128
New York Central and Hudson River	6,909	7,497	7,276	6,762	6,576	6,022	5,968
New York, Lake Erie and Western	3,651	3,705	3,461	3,427	3,220	3,070	3,119
Ogdensburg and Lake Champlain	164	149	142	116	99	98	94
Rome, Watertown and Ogdensburg	438	424	426	506	480	448	353
Troy and Boston	228	205	182	182	157	174	164
Utica and Black River	174	189	201	208	185	158	191
Central of New Jersey	1,460	1,673	1,498	1,728	1,580	1,573	1,680
United New Jersey	4,060	4,504	4,440	7,206	3,684	3,544	3,030
West Jersey	427	490	389	473	358	326	337
Allegheny Valley	562	515	421	481	609	452	383
Northern Central	897	864	816	861	698	637	628
Pennsylvania	4,399	4,283	3,772	5,368	3,288	3,848	3,088
Philadelphia and Erie	632	527	459	526	372	340	340
Philadelphia, Wilmington and Baltimore	1,728	1,747	1,690	2,294	1,659	1,571	1,541
Baltimore and Potomac	244	885	426	437	285	371	397
Atlantic, Mississippi and Ohio	445	836	376	371	342	336	394
Chesapeake and Ohio	449	453	409	396	359	361	337
Atlantic and Great Western	996	926	848	783	734	835	991
Cleveland, Columbus, Cincinnati and Indianapolis	831	786	775	801	681	675	740
Cleveland and Pittsburgh	862	580	546	526	461	432	439
Lake Shore and Michigan Southern	4,570	4,249	3,923	3,664	3,203	3,037	3,128
Marquette, Houghton and Ontonagon	44	44	140	94	61	43	48
Philadelphia and Reading	1,641	1,787	1,977	2,013	1,868	1,536	1,994
Total	50,286	50,783	48,759	52,458	43,856	41,233	41,189
Grand total	71,288	71,079	70,726	74,573	63,659	61,574	62,568

* Consolidated with New York and New England.



APPENDIX S.—SCHEDULE c.

Tons of freight carried.

WESTERN RAILROADS.

[Numbers are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	1, 642	1, 421	1, 546	1, 818	1, 560	1, 967	2, 384
Chicago, Burlington and Quincy	2, 222	2, 421	2, 397	2, 893	3, 250	3, 975	4, 687
Chicago and Northwestern	2, 968	3, 561	3, 153	3, 472	3, 413	3, 911	4, 266
Chicago, Rock Island and Pacific	1, 287	1, 399	1, 718	1, 640	1, 651	1, 768	2, 238
Illinois Central	2, 057	2, 070	2, 016	1, 900	1, 803	2, 068	2, 324
Hannibal and Saint Joseph	340	345	811	452	498	543	623
International and Great Northern	113	164	178	201	222	234	254
Union Pacific	487	482	501	630	716	844	993
Atchison, Topeka and Santa Fé	156	186	252	326	372	611	1, 093
Kansas Pacific	263	247	251	290	338	698	724
Central Pacific	941	1, 029	1, 096	1, 284	1, 415	1, 788	1, 864
Total	12, 466	13, 355	13, 419	14, 906	15, 238	18, 367	21, 618

EASTERN RAILROADS.

Maine Central	401	422	374	383	385	330	396
Cheshire	456	425	416	438	389	419	419
Boston and Albany	2, 985	2, 068	2, 439	2, 541	2, 902	2, 643	2, 738
Boston and Maine	542	553	647	702	699	593	696
Boston and Providence	828	1789	691	580	632	570	596
Eastern (Massachusetts)	586	660	662	635	705	696	686
Fitchburg	777	966	727	888	956	1, 116	1, 313
New York and New England	364	363	345	331	350	435	571
Old Colony	625	634	626	620	715	631	1, 014
Hartford, Providence and Fishkill	298	287	294	303	297	253	(*)
New Haven and Northampton	299	260	257	263	267	273	311
New London and Northern	206	192	177	261	291	296	298
New York, New Haven and Hartford	696	815	828	836	896	899	1, 216
Buffalo, New York and Philadelphia	159	252	313	375	503	569	1, 063
New York Central and Hudson River	5, 522	6, 115	6, 002	6, 804	6, 861	8, 176	9, 016
New York, Lake Erie and Western	6, 313	6, 364	6, 240	5, 973	6, 182	6, 150	8, 213
Ogdensburg and Lake Champlain	429	842	269	238	241	270	346
Rome, Watertown and Ogdensburg	361	484	377	361	367	371	371
Troy and Boston	203	207	224	374	425	596	612
Utica and Black River	107	117	105	105	101	104	109
Central of New Jersey	1, 441	1, 125	919	922	1, 083	896	*1, 008
United New Jersey	2, 854	3, 277	3, 258	3, 577	3, 962	3, 840	5, 038
West Jersey	180	113	144	132	127	120	162
Allegheny Valley	1, 779	1, 795	2, 055	2, 202	2, 457	2, 127	2, 471
Northern Central	5, 534	5, 211	5, 794	5, 579	6, 160	5, 803	7, 521
Pennsylvania	9, 211	8, 627	9, 115	9, 923	9, 738	10, 947	14, 453
Philadelphia and Erie	2, 164	2, 243	2, 396	2, 517	2, 681	2, 810	4, 130
Philadelphia, Wilmington and Baltimore	500	320	333	739	760	798	1, 095
Baltimore and Potomac	100	161	216	223	251	265	347
Atlantic, Mississippi and Ohio	412	322	307	328	339	541	359
Chesapeake and Ohio	248	306	360	115	472	586	667
Atlantic and Great Western	2, 713	2, 709	2, 429	2, 507	2, 761	2, 654	3, 360
Cleveland, Columbus, Cincinnati and Indianapolis	1, 681	1, 532	1, 611	1, 745	1, 624	1, 949	2, 300
Cleveland and Pittsburgh	1, 982	1, 442	1, 324	1, 190	1, 428	1, 434	1, 810
Lake Shore and Michigan Southern	5, 177	5, 221	5, 022	5, 635	5, 513	6, 096	7, 541
Marquette, Houghton and Ontonagon	745	641	639	638	652	663	645
Philadelphia and Reading	3, 331	3, 099	2, 720	2, 493	2, 598	2, 758	4, 175
Total	62, 259	61, 018	60, 655	63, 281	66, 190	69, 678	87, 924
Grand total	74, 725	74, 373	74, 074	78, 187	81, 428	88, 045	109, 542

* Consolidated with New York and New England.

APPENDIX S.—SCHEDULE *f*.*Tons of freight carried one mile.*

WESTERN RAILROADS.

[Numbers are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	179, 436	162, 307	168, 924	217, 635	211, 948	248, 286	402, 284
Chicago, Burlington and Quincy	418, 385	445, 686	436, 363	536, 355	561, 650	723, 455	1, 139, 784
Chicago and Northwestern	366, 475	461, 412	454, 550	563, 132	453, 358	623, 769	681, 878
Chicago, Rock Island and Pacific	219, 364	249, 538	287, 614	267, 511	276, 199	357, 359	484, 610
Illinois Central	275, 303	273, 559	284, 651	246, 601	249, 346	306, 346	335, 471
Hannibal and Saint Joseph	58, 843	58, 632	52, 866	70, 932	80, 765	100, 013	111, 967
International and Great Northern	15, 275	22, 341	25, 493	30, 018	35, 810	39, 579	43, 970
Union Pacific	233, 362	263, 239	269, 415	292, 002	334, 645	366, 014	436, 054
Atchison, Topeka and Santa Fé	24, 868	27, 495	46, 245	61, 791	72, 719	133, 180	226, 965
Kansas Pacific	61, 989	62, 476	72, 120	71, 540	85, 393	140, 013	167, 143
Central Pacific	248, 793	280, 396	310, 593	363, 460	363, 542	392, 261	592, 950
Total	2, 102, 213	2, 306, 114	2, 415, 134	2, 675, 177	2, 787, 478	3, 430, 195	4, 411, 166

EASTERN RAILROADS.

Maine Central	23, 151	25, 313	23, 288	25, 030	25, 628	21, 194	27, 652
Cheshire	25, 256	23, 581	23, 082	23, 689	21, 833	22, 278	23, 336
Chicago and Albany	317, 671	290, 672	282, 310	301, 625	312, 823	329, 709	325, 485
Boston and Maine	20, 928	22, 881	25, 411	30, 422	36, 096	28, 949	32, 334
Boston and Providence	21, 351	19, 114	18, 450	18, 493	18, 156	16, 561	18, 706
Eastern (Massachusetts)	20, 642	37, 087	35, 687	34, 224	39, 100	39, 116	44, 986
Fitchburg	20, 903	21, 548	22, 032	41, 692	53, 225	68, 041	92, 833
New York and New England	9, 150	9, 357	9, 305	9, 469	11, 321	18, 939	36, 655
Old Colony	16, 790	18, 251	18, 371	17, 897	21, 388	18, 447	42, 450
Hartford, Providence and Fish- kill	7, 847	6, 903	7, 348	7, 706	7, 854	7, 300	(*)
New Haven and Northampton	13, 383	12, 779	10, 102	11, 257	11, 720	11, 889	14, 943
New London and Northern	9, 927	9, 778	9, 237	10, 730	12, 170	11, 610	12, 638
New York, New Haven and Hart- ford	38, 892	36, 092	34, 937	37, 225	39, 647	45, 595	63, 187
Buffalo, New York and Phila- delphia	7, 753	21, 237	28, 416	31, 109	44, 031	60, 123	83, 907
New York Central and Hudson River	1, 246, 650	1, 391, 560	1, 404, 008	1, 674, 447	1, 619, 949	2, 084, 355	2, 295, 827
New York, Lake Erie and West- ern	1, 032, 987	1, 047, 420	1, 016, 618	1, 040, 431	1, 114, 596	1, 224, 764	1, 569, 223
Ogdensburg and Lake Cham- plain	37, 931	30, 158	24, 411	20, 141	21, 475	24, 535	22, 439
Rome, Watertown and Ogdens- burg	24, 976	21, 281	21, 166	20, 366	26, 733	24, 967	25, 914
Troy and Boston	5, 396	5, 718	6, 725	13, 909	16, 854	23, 629	30, 502
Utica and Black River	4, 506	5, 089	5, 294	5, 150	5, 065	5, 206	6, 062
Central of New Jersey	85, 725	65, 925	52, 160	50, 668	65, 831	40, 910	49, 092
United New Jersey	150, 011	178, 185	187, 700	180, 636	256, 134	255, 027	332, 290
West Jersey	4, 064	3, 645	4, 371	4, 084	3, 796	3, 625	5, 217
Allegheny Valley	80, 783	71, 799	95, 860	98, 029	106, 609	84, 077	94, 607
Northern Central	226, 040	216, 960	258, 540	253, 552	277, 733	280, 237	404, 196
Pennsylvania	1, 384, 832	1, 372, 567	1, 479, 414	1, 629, 742	1, 494, 798	1, 732, 003	2, 136, 709
Philadelphia and Erie	268, 091	294, 467	311, 919	340, 391	335, 727	381, 300	505, 918
Philadelphia, Wilmington and Baltimore	41, 973	39, 371	34, 260	38, 094	42, 090	46, 080	58, 147
Baltimore and Potomac	2, 393	4, 621	5, 684	5, 467	5, 657	6, 409	8, 396
Atlantic, Mississippi and Ohio	47, 992	54, 641	55, 982	60, 610	67, 532	70, 797	73, 662
Chesapeake and Ohio	32, 399	60, 264	80, 000	97, 901	116, 948	153, 062	167, 838
Atlantic and Great Western	311, 037	319, 225	282, 715	293, 293	329, 132	330, 728	436, 022
Cleveland, Columbus, Cincinnati and Indianapolis	276, 310	264, 164	263, 312	311, 786	275, 696	345, 845	401, 106
Cleveland and Pittsburgh	167, 483	124, 537	116, 819	108, 064	133, 991	143, 114	164, 076
Lake Shore and Michigan South- ern	1, 053, 927	909, 342	943, 236	1, 133, 835	1, 080, 006	1, 340, 468	1, 733, 423
Marquette, Houghton and On- taronagon	16, 191	16, 813	14, 082	14, 237	15, 478	15, 816	15, 124
Philadelphia and Reading	161, 644	150, 054	143, 510	137, 989	147, 962	151, 807	228, 887
Total	7, 210, 977	7, 292, 369	7, 355, 762	8, 143, 990	8, 216, 154	9, 468, 210	11, 584, 490
Grand total	9, 312, 190	9, 598, 483	9, 770, 896	10, 819, 167	11, 003, 629	12, 898, 405	15, 995, 566

* Consolidated with New York and New England.

APPENDIX S.—SCHEDULE g.

Freight earnings.

WESTERN RAILROADS.

[Amounts are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	\$3,897	\$3,447	\$3,174	\$3,541	\$3,068	\$3,409	\$4,243
Chicago, Burlington and Quincy	8,035	8,445	8,503	8,521	9,535	11,152	11,651
Chicago and Northwestern	8,614	10,270	8,838	9,001	8,282	10,017	9,924
Chicago, Rock Island and Pacific	4,598	5,003	5,292	5,121	4,708	5,576	6,380
Illinois Central	4,149	3,987	3,619	3,190	3,032	3,174	3,233
Hannibal and Saint Joseph	1,176	1,047	954	1,129	1,210	1,295	1,248
International and Great Northern	899	1,033	1,053	1,097	1,131	1,216	1,390
Union Pacific	5,517	5,065	6,642	7,804	7,598	8,296	8,682
Atchison, Topeka and Santa Fé	805	886	1,117	1,698	1,858	2,826	4,833
Kansas Pacific	2,077	1,966	2,157	1,968	2,329	2,564	3,274
Central Pacific	7,463	7,986	9,938	10,774	10,095	10,902	10,935
Total	47,220	49,686	51,267	53,644	52,821	60,357	66,403

EASTERN RAILROADS.

Maine Central	\$1,011	\$1,029	\$865	\$836	\$833	\$702	\$794
Chesbire	600	513	438	408	363	378	345
Boston and Albany	6,221	5,284	4,328	3,886	3,765	3,721	3,589
Boston and Maine	821	820	810	836	837	760	805
Boston and Providence	809	713	619	569	509	417	434
Eastern (Massachusetts)	680	1,054	993	908	970	912	998
Fitchburg	789	932	910	1,046	1,106	1,092	1,206
New York and New England	404	449	447	447	477	506	1,050
Old Colony	775	753	741	713	788	697	1,142
Hartford, Providence and Fishkill	471	430	447	417	418	333	(*)
New Haven and Northampton	471	459	418	404	392	375	413
New London and Northern	321	282	263	274	303	285	284
New York, New Haven and Hartford	1,469	1,332	1,431	1,318	1,327	1,310	1,492
Buffalo, New York and Philadelphia	244	404	453	490	538	704	797
New York Central and Hudson River	19,616	20,349	17,900	17,593	16,434	19,046	18,270
New York, Lake Erie and Western	15,015	13,740	12,287	11,430	10,648	11,914	12,383
Ogdensburg and Lake Champlain	838	671	488	383	339	354	307
Rome, Watertown and Ogdensburg	692	607	632	632	683	656	647
Troy and Boston	305	307	315	353	350	364	409
Utica and Black River	234	262	264	250	247	248	269
Central of New Jersey	1,920	1,594	1,287	1,252	1,283	1,361	1,282
United New Jersey	3,409	3,714	3,778	3,312	4,017	3,792	5,061
West Jersey	215	186	205	192	176	161	192
Allegheny Valley	2,007	1,902	1,895	1,884	1,819	1,345	1,301
Northern Central	3,646	3,360	3,692	3,230	3,153	2,837	3,272
Pennsylvania	19,609	17,228	15,652	14,540	14,642	15,965	17,017
Philadelphia and Erie	3,043	2,773	2,827	2,641	2,716	2,500	2,589
Philadelphia, Wilmington and Baltimore	1,226	1,011	1,052	915	1,054	952	1,176
Baltimore and Potomac	125	185	220	217	201	202	231
Atlantic, Mississippi and Ohio	1,588	1,319	1,250	1,217	1,323	1,318	1,246
Cheapeake and Ohio	710	950	994	1,178	1,285	1,527	1,445
Atlantic and Great Western	4,135	3,738	2,914	2,730	2,912	2,765	3,085
Cleveland, Columbus, Cincinnati and Indianapolis	3,736	3,148	2,647	2,537	2,454	2,601	2,796
Cleveland and Pittsburgh	2,970	2,201	1,943	1,645	1,766	1,751	1,884
Lake Shore and Michigan Southern	14,192	11,918	9,639	9,405	9,476	10,048	11,268
Marquette, Houghton and Ontonagon	920	777	649	615	610	514	496
Philadelphia and Reading	3,603	3,380	3,026	2,949	2,914	2,691	3,827
Total	118,840	109,772	98,720	93,652	93,118	97,094	103,562
Grand total	166,060	159,458	149,987	147,296	145,939	157,451	169,965

*Consolidated with New York and New England.

APPENDIX S.—SCHEDULE A.

Gross earnings.

WESTERN RAILROADS.

[Amounts are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	\$5,496	\$5,126	\$4,657	\$4,961	\$4,464	\$4,672	\$5,756
Chicago, Burlington and Quincy	11,405	11,645	11,791	12,058	12,551	14,120	14,789
Chicago and Northwestern	12,737	14,352	12,708	12,774	11,878	13,584	13,421
Chicago, Rock Island and Pacific	6,419	7,048	7,389	7,842	6,918	7,886	9,410
Illinois Central	8,268	7,901	7,893	7,041	6,640	7,111	7,224
Hannibal and Saint Joseph	2,029	1,913	1,748	1,884	1,981	2,045	1,997
International and Great Northern	1,157	1,572	1,408	1,454	1,560	1,637	1,776
Union Pacific	10,266	10,560	11,994	12,887	12,473	12,874	13,201
Atchison, Topeka and Santa Fé	1,217	1,251	1,520	2,487	2,679	3,951	6,261
Kansas Pacific	3,563	3,357	3,364	3,001	3,285	3,610	4,068
Central Pacific	12,864	13,612	15,165	16,966	16,471	17,531	17,153
Total	75,223	78,337	79,547	82,865	80,850	89,031	95,772

EASTERN RAILROADS.

Maine Central	\$2,068	\$2,089	\$1,782	\$1,726	\$1,048	\$1,435	\$1,508
Cheahire	838	743	627	580	518	528	463
Boston and Albany	9,541	8,065	7,624	6,828	6,473	6,272	6,074
Boston and Maine	2,680	2,308	2,263	2,278	2,173	2,101	2,150
Boston and Providence	1,801	1,657	1,555	1,440	1,353	1,185	1,159
Eastern (Massachusetts)	2,132	2,941	2,766	2,412	2,451	2,422	2,441
Fitchburg	1,366	1,629	1,668	1,720	1,792	1,794	1,923
New York and New England	826	893	890	963	966	1,006	1,084
Old Colony	2,310	2,326	2,224	2,123	2,175	2,078	2,798
Hartford, Providence and Fishkill	1,039	945	980	914	858	800	(*)
New Haven and Northampton	658	646	593	586	544	548	588
New London and Northern	803	500	500	499	508	470	470
New York, New Haven and Hartford	4,550	4,402	4,450	4,308	3,938	3,817	3,913
Buffalo, New York and Philadelphia	398	581	613	687	665	865	955
New York Central and Hudson River	27,907	29,497	26,585	25,791	24,889	26,405	25,746
New York, Lake Erie and Western	20,013	18,599	16,877	15,852	14,709	15,645	15,942
Ogdensburg and Lake Champlain	1,026	856	659	568	528	543	472
Rome, Watertown and Ogdensburg	1,215	1,122	1,150	1,222	1,249	1,214	1,143
Troy and Boston	552	530	524	567	561	560	594
Utica and Black River	424	471	485	482	454	453	476
Central of New Jersey	8,881	8,609	7,412	6,983	5,753	5,500	6,731
United New Jersey	8,517	8,701	8,643	10,942	8,064	7,697	9,089
West Jersey	681	623	655	731	595	542	584
Allegheny Valley	2,628	2,479	2,400	2,438	2,492	1,910	1,745
Northern Central	5,031	4,677	4,925	4,870	4,070	3,728	4,108
Pennsylvania	24,886	22,642	20,494	20,788	18,963	20,317	21,744
Philadelphia and Erie	3,842	3,507	3,366	3,353	3,173	3,021	3,092
Philadelphia, Wilmington and Baltimore	3,075	2,876	2,850	3,205	2,916	2,690	2,850
Baltimore and Potomac	382	616	678	723	646	669	700
Atlantic, Mississippi and Ohio	2,194	1,825	1,782	1,742	1,792	1,782	1,672
Chesapeake and Ohio	1,211	1,400	1,459	1,690	1,706	1,966	1,992
Atlantic and Great Western	5,387	4,838	3,914	3,672	3,906	3,745	4,117
Cleveland, Columbus, Cincinnati and Indianapolis	4,887	4,249	3,774	3,676	3,434	3,529	3,675
Cleveland and Pittsburgh	3,740	2,898	2,629	2,282	2,330	2,272	2,419
Lake Shore and Michigan Southern	10,415	17,146	14,434	13,949	13,505	13,990	15,271
Marquette, Houghton and Ontonagon	1,071	883	719	680	676	506	553
Philadelphia and Reading	14,838	14,452	12,661	12,228	12,143	11,540	13,106
Total	192,606	188,871	167,600	164,954	154,030	155,490	164,147
Grand total	287,831	263,208	246,147	247,819	234,880	244,521	259,919

* Consolidated with New York and New England.

APPENDIX 8—SCHEDULE i.

Operating expenses.

WESTERN RAILROADS.

[Amounts are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	\$3, 376	\$2, 901	\$2, 604	\$2, 691	\$2, 357	\$2, 515	\$3, 050
Chicago, Burlington and Quincy	6, 182	6, 219	6, 121	6, 475	6, 851	7, 583	7, 557
Chicago and Northwestern	8, 178	9, 276	7, 965	7, 409	6, 548	6, 756	6, 604
Chicago, Rock Island and Pacific	3, 277	3, 739	3, 572	3, 438	3, 323	4, 137	4, 982
Illinois Central	4, 600	4, 030	3, 989	3, 846	3, 122	3, 037	3, 027
Hannibal and Saint Joseph	1, 780	1, 435	1, 362	1, 394	1, 136	1, 265	1, 223
International and Great Northern	576	825	792	862	1, 094	1, 065	1, 178
Union Pacific	4, 975	4, 855	4, 982	5, 268	5, 273	5, 377	5, 476
Atchison, Topeka and Santa Fe	786	558	699	1, 175	1, 323	2, 041	2, 926
Kansas Pacific	2, 117	1, 671	1, 791	1, 783	1, 917	2, 412	2, 738
Central Pacific	4, 969	5, 268	6, 487	7, 857	7, 774	8, 786	11, 207
Total	40, 816	40, 777	40, 384	42, 198	40, 718	44, 974	49, 848

EASTERN RAILROADS.

Maine Central	\$1, 331	\$1, 282	\$1, 147	\$1, 042	\$1, 004	\$841	\$870
Cheshire	606	588	581	482	382	404	346
Boston and Albany	7, 561	6, 548	5, 372	4, 683	4, 613	4, 414	3, 724
Boston and Maine	1, 612	1, 546	1, 595	1, 524	1, 519	1, 359	1, 355
Boston and Providence	1, 385	1, 222	1, 125	1, 040	975	837	763
Eastern (Massachusetts)	1, 667	1, 990	2, 070	1, 787	1, 709	1, 581	1, 451
Fitchburg	1, 044	1, 303	1, 327	1, 330	1, 364	1, 335	1, 357
New York and New England	729	717	767	771	771	808	1, 447
Old Colony	1, 065	1, 634	1, 554	1, 477	1, 454	1, 374	1, 707
Hartford, Providence and Fishkill	969	932	784	745	661	633	(*)
New Haven and Northampton	456	457	399	390	353	342	349
New London and Northern	480	381	377	348	371	341	311
New York, New Haven and Hartford	2, 854	2, 605	2, 728	2, 574	2, 222	2, 168	2, 021
Buffalo, New York and Philadelphia	244	394	835	427	329	414	574
New York Central and Hudson River	17, 642	18, 388	17, 262	16, 124	14, 946	16, 136	16, 122
New York, Lake Erie and Western	13, 641	13, 564	12, 679	12, 231	10, 900	10, 636	11, 175
Ogdensburg and Lake Champlain	708	601	476	399	358	398	368
Rome, Watertown and Ogdensburg	906	788	891	944	912	963	835
Troy and Boston	280	264	277	298	284	296	305
Utica and Black River	200	241	252	287	234	214	291
Central of New Jersey	4, 216	4, 141	4, 129	3, 795	3, 269	3, 285	4, 095
United New Jersey	6, 792	6, 330	5, 894	6, 227	5, 789	5, 152	6, 174
West Jersey	416	438	306	463	391	339	333
Allegheny Valley	1, 844	1, 630	1, 415	1, 354	1, 347	995	993
Northern Central	3, 771	3, 384	3, 362	3, 242	2, 746	2, 604	2, 962
Pennsylvania	14, 869	12, 702	11, 794	12, 453	10, 751	10, 921	11, 733
Philadelphia and Erie	3, 413	2, 438	2, 411	2, 188	2, 050	2, 045	2, 130
Philadelphia, Wilmington and Baltimore	1, 980	1, 732	1, 668	1, 730	1, 755	1, 565	1, 568
Baltimore and Potomac	381	485	550	603	535	546	526
Atlantic, Mississippi and Ohio	1, 280	1, 098	1, 109	1, 202	1, 191	1, 352	1, 110
Chesapeake and Ohio	880	1, 214	1, 112	1, 243	1, 363	1, 595	1, 507
Atlantic and Great Western	3, 571	3, 768	3, 241	2, 954	3, 044	3, 099	3, 436
Cleveland, Columbus, Cincinnati and Indianapolis	3, 550	3, 346	2, 890	2, 974	2, 946	2, 821	2, 809
Cleveland and Pittsburgh	1, 906	1, 479	1, 388	1, 591	1, 292	1, 366	1, 267
Lake Shore and Michigan Southern	13, 747	11, 152	10, 832	9, 575	8, 964	8, 466	8, 634
Marquette, Houghton and Ontonagon	625	464	407	349	390	267	277
Philadelphia and Reading	7, 101	6, 410	6, 090	6, 130	5, 530	5, 232	6, 206
Total	126, 254	117, 568	110, 313	106, 742	98, 664	96, 984	101, 362
Grand total	167, 070	158, 345	150, 697	149, 940	139, 382	141, 958	151, 210

* Consolidated with New York and New England.

APPENDIX S.—SCHEDULE k.

Net earnings.

WESTERN RAILROADS.

[Amounts are stated in thousands.]

Name of company.	1873.	1874.	1875.	1876.	1877.	1878.	1879.
Chicago and Alton	\$2, 121	\$2, 225	\$2, 053	\$2, 269	\$2, 107	\$2, 157	\$2, 706
Chicago, Burlington and Quincy	4, 970	5, 426	5, 671	5, 583	5, 700	6, 587	7, 233
Chicago and Northwestern	4, 558	5, 076	4, 723	5, 885	5, 330	6, 828	6, 817
Chicago, Rock Island and Pacific	2, 901	3, 171	3, 532	3, 687	3, 384	3, 759	4, 548
Illinois Central	3, 686	3, 871	3, 813	3, 185	3, 517	4, 024	4, 207
Hannibal and Saint Joseph	248	478	387	470	795	780	774
International and Great Northern	581	747	616	592	466	572	598
Union Pacific	5, 281	5, 705	7, 012	7, 619	7, 260	7, 497	7, 725
Atchison, Topeka and Santa Fé	431	683	832	1, 811	1, 356	1, 910	3, 455
Kansas Pacific	1, 446	1, 686	1, 573	1, 218	1, 968	1, 968	1, 926
Central Pacific	7, 895	8, 343	8, 678	9, 136	8, 697	8, 745	5, 946
Total	34, 110	37, 421	38, 880	40, 445	39, 920	44, 057	44, 924

EASTERN RAILROADS.

Maine Central	\$738	\$907	\$635	\$684	\$645	\$594	\$638
Cheesbire	231	155	56	118	126	124	147
Boston and Albany	1, 979	2, 117	2, 252	2, 145	1, 860	1, 858	2, 360
Boston and Maine	661	762	668	746	654	742	795
Boston and Providence	416	435	430	400	378	348	376
Eastern (Massachusetts)	445	942	696	625	743	841	1, 010
Fitchburg	322	326	341	390	428	439	566
New York and New England	98	176	132	226	185	198	487
Old Colony	644	692	670	646	721	704	1, 091
Hartford, Providence and Fishkill	170	154	176	169	197	167	(*)
New Haven and Northampton	202	190	193	178	192	206	229
New London and Northern	124	120	123	150	137	129	159
New York, New Haven and Hartford	1, 696	1, 797	1, 813	1, 729	1, 716	1, 649	1, 892
Buffalo, New York and Philadelphia	154	187	278	229	337	451	381
New York Central and Hudson River	10, 265	11, 109	9, 823	9, 667	9, 443	10, 269	9, 623
New York, Lake Erie and Western	6, 372	5, 085	4, 198	3, 621	3, 809	5, 009	4, 767
Ogdensburg and Lake Champlain	818	352	183	169	165	145	104
Rome, Watertown and Ogdensburg	308	835	259	278	337	351	308
Troy and Boston	262	246	248	268	277	274	289
Utica and Black River	224	230	233	194	220	239	185
Central of New Jersey	4, 666	4, 469	3, 283	3, 188	2, 485	2, 305	2, 636
United New Jersey	1, 725	2, 371	2, 749	4, 715	2, 276	2, 545	2, 915
West Jersey	265	186	293	268	204	203	252
Allegheny Valley	784	849	985	1, 084	1, 145	915	762
Northern Central	1, 200	1, 293	1, 564	1, 128	1, 324	1, 119	1, 246
Pennsylvania	10, 017	9, 941	8, 700	8, 334	8, 232	9, 396	9, 992
Philadelphia and Erie	429	1, 069	955	1, 165	1, 123	876	962
Philadelphia, Wilmington and Baltimore	1, 095	1, 144	1, 181	1, 576	1, 161	1, 095	1, 282
Baltimore and Potomac .....	.....	131	128	120	112	98	174
Atlantic, Mississippi and Ohio	914	728	674	541	601	430	562
Cheapeake and Ohio	331	246	347	356	339	341	385
Atlantic and Great Western	1, 816	1, 070	673	718	764	676	681
Cleveland, Columbus, Cincinnati and Indianapolis	1, 337	903	894	703	489	708	986
Cleveland and Pittsburgh	1, 834	1, 409	1, 244	891	1, 039	966	1, 152
Lake Shore and Michigan Southern	5, 668	5, 994	3, 903	4, 674	4, 541	5, 494	6, 337
Marquette, Houghton and Ontonagon	446	899	311	332	346	299	276
Philadelphia and Reading	7, 732	8, 043	6, 601	6, 098	6, 613	6, 308	6, 896
Total	65, 968	66, 312	57, 392	58, 231	55, 374	58, 506	62, 786
Grand total	100, 078	103, 733	96, 272	98, 676	95, 294	101, 653	109, 545

* Consolidated with New York and New England.

APPENDIX T.

EXTRACTS FROM POOR'S MANUAL OF RAILROADS FOR 1879 AND 1880, WITH
Statement from Poor's Manual of Railroads for 1879, showing the mileage, equipment,

Items.	In the New England States.	In the Middle States.	In the Southern States.	In the Western States.
Length of lines.....miles	5,865.53	14,776.99	13,683.42	41,732.83
Length of sidings, &c.....do	2,029.36	9,885.63	1,101.54	6,778.74
Engines.....number	1,684	5,700	1,797	6,680
Passenger cars.....do	1,852	4,420	1,162	3,455
Baggage, mail, and express cars.do	612	1,322	508	1,749
Freight cars.....do	30,598	205,144	26,407	146,785
Capital stock.....	\$187,829,663 00	\$691,461,574 00	\$222,935,148 00	\$1,004,620,856 00
Funded debt.....	105,815,520 00	725,168,683 00	245,798,436 00	967,861,381 00
Other debt.....	11,610,290 00	52,146,190 00	22,613,818 00	79,837,758 00
Total stock and debt.....	305,255,413 00	1,468,776,417 00	489,342,402 00	2,071,919,945 00
Cost of road and equipment.....	285,121,385 00	1,098,067,136 00	442,613,636 00	1,939,030,054 00
Miles of road operated *.....	5,628.07	14,599.71	12,498.40	41,604.62
Gross earnings.....	\$41,260,203 00	\$155,458,968 00	\$42,797,284 00	\$209,858,376 00
Working expenses.....	27,574,276 00	93,898,975 00	28,417,326 00	181,894,046 00
Net earnings.....	13,685,927 00	61,559,993 00	14,379,958 00	77,966,239 00
Interest paid on bonds.....	5,152,131 00	40,180,966 00	7,618,411 00	40,189,144 00
Per cent.....	4.87	5.54	3.09	4.07
Dividends paid on stock.....	7,566,655 00	21,148,442 00	2,805,799 00	19,341,222 00
Per cent.....	4.03	3.06	1.27	1.92

* Evidently roads only which have reported to Mr. Poor.

The figures given above as to the Union and Central Pacific Railroad Companies furnished

Name of road.	Length of line, in miles.	Length of sidings, in miles.	No. of engines.	No. of passenger cars.	No. of baggage, mail, and express cars.	No. of freight cars.	Capital stock.	Funded debt.	Other debt.
Union Pacific.....	1,088.46	194.7	160	194	41	3,216	\$36,762,800	\$77,907,512	\$2,367,110
Central Pacific.....	1,308.56	180.27	227	248	51	5,212	54,275,500	84,249,680	5,341,088
The two.....	2,242.02	374.97	386	372	92	8,428	91,037,800	162,157,192	7,548,178

APPENDIX T.

CORRECTIONS AS TO THE UNION AND CENTRAL PACIFIC RAILROAD COMPANIES.

capital, cost, and revenue of all the railroads in the United States for the year 1878.

In the Pacific States and Territories.	Total other than the Union and Central Pacific Railroads.	Union Pacific Railroad.	Central Pacific Railroad.	Total of Union and Central Pacific Railroads.	Total United States.
2,517.04	78,575.81	*1,042.40	1,213.88	2,255.78	80,881.30
237.97	10,533.24	116.12	109.47	285.59	19,818.83
278	16,089	179	227	406	16,445
845	11,234	183	816	449	11,683
87	4,818	44	51	95	4,413
6,876	415,550	3,201	4,262	7,463	423,013
<hr/>					
\$86,372,898 00	\$2,201,230,077 00	\$36,782,800 00	\$54,275,500 00	\$91,057,800 00	\$2,292,257,877 00
56,739,754 00	2,115,478,724 00	78,062,512 00	104,249,680 00	182,312,192 00	2,297,790,916 00
7,686,807 00	173,403,773 00	2,000,000 00	6,844,783 00	8,844,783 00	182,248,556 00
<hr/>					
154,808,397 00	4,490,102,574 00	116,824,812 00	165,369,968 00	282,194,775 00	4,772,297,349 00
<hr/>					
128,328,075 00	3,908,161,186 00	118,081,062 00	145,089,688 00	263,170,735 00	4,166,331,921 00
<hr/>					
2,063.76	76,394.56	1,042.40	1,213.88	2,255.78	78,650.34
<hr/>					
\$16,062,491 00	\$450,451,221 00	\$13,121,272 00	\$17,530,858 00	\$30,652,180 00	\$490,103,351 00
6,580,856 00	288,865,479 00	5,376,586 00	8,786,119 00	14,162,705 00	302,528,784 00
<hr/>					
3,501,635 00	171,065,742 00	7,744,686 00	8,744,739 00	16,489,425 00	187,575,167 00
<hr/>					
2,007,858 00	95,743,010 00	3,466,443 00	3,954,050 00	7,420,502 00	103,163,512 00
5.13	4.53	4.44	3.79	4.07	4.49
990,000 00	51,792,118 00	1,837,250 00	-----	1,837,250 00	53,620,368 00
.09	2.35	5	-----	5	2.34

are subject to the following corrections, as made by said companies in statement this office:

Total stock and debt.	Cost of road and equipment.	Miles of road operated.	Gross earnings.	Working expenses.	Net earnings.	Interest paid on bonds.	Per cent.	Dividends paid on stock.	Per cent.
\$116,376,823	\$119,743,071	1,063.46	\$13,121,272	\$5,376,586	\$7,744,686	\$3,466,443	6.9	\$1,837,250	5
146,686,968	146,578,402	2,168.60	17,530,858	8,780,312	8,750,546	3,478,470	6.16	-----	..
<hr/>									
267,446,810	266,327,073	3,262.15	30,652,130	14,156,898	16,495,282	6,926,813	6.43	-----	..

APPENDIX T.

Statement from Poor's Manual of Railroads for 1890, showing the mileage, equipment,

Items.	In the New England States.	In the Middle States.	In the Southern States.	In the Western States.
Length of lines.....miles.	6,054.85	14,602.42	14,195.59	44,732.93
Length of sidings, &c.....do.	2,056.22	9,267.84	1,239.05	7,010.37
Engines.....number.	1,626	5,869	1,901	7,018
Passenger cars.....do.	1,897	4,857	1,249	3,417
Baggage, mail, and express cars do.	645	1,499	542	1,669
Freight cars.....do.	32,770	237,335	27,435	171,681
Capital stock	\$197,123,945 00	\$719,563,253 00	\$238,289,118 00	\$1,119,881,613 00
Funded debt.....	115,395,591 00	705,771,550 00	224,827,764 00	1,006,204,968 00
Other debt.....	16,269,956 00	42,892,268 00	17,771,003 00	68,427,266 00
Total stock and debt.....	328,789,492 00	1,468,227,071 00	480,887,885 00	2,194,513,787 00
Cost of road and equipment	\$306,870,237 00	\$1,167,630,960 00	\$460,171,413 00	\$2,047,406,604 00
Miles of road operated.....	6,155.92	14,940.64	13,388.78	44,163.58
Gross earnings.....	\$41,329,825 00	\$170,310,846 00	\$43,917,284 00	\$232,379,646 00
Working expenses.....	25,743,784 00	99,898,876 00	29,243,927 00	133,417,740 00
Net earnings.....	15,586,041 00	70,411,970 00	14,673,357 00	98,961,906 00
Interest paid on bonds	\$5,492,690 00	\$39,252,884 00	\$5,894,446 00	\$51,104,575 00
Per cent.....	4.75	5.50	2.62	5.07
Dividends paid on stock	\$7,234,205 00	\$24,335,164 00	\$2,131,770 00	\$23,561,262 00
Per cent.....	3.67	3.88	.91	2.10

The figures given above as to the Union and Central Pacific Railroad Companies are this office for the

Name of road.	Length of line owned, in miles.	Length of sidings, in miles.	No. of engines.	No. of passenger cars.	No. of baggage, mail, and express cars.	No. of freight cars.	Capital stock.	Funded debt.	Other debt.
Union Pacific	1,038	200	178	124	41	3,220	\$6,762,800 00	\$7,731,513 00	\$19,205,038 84
Central Pacific	1,204.50	194.33	264	298	68	5,820	\$4,275,500 00	\$4,885,680 00	\$26,081,123 66
Total.....	2,242.50	394.33	442	422	109	8,540	\$11,037,800 00	\$12,617,192 00	\$45,286,171 50

* Including interest due on United States subsidy bonds.

APPENDIX T.

capital, cost, and revenue of all the railroads in the United States for the year 1879.

In the Pacific States and Territories.	Total other than the Union and Central Pacific Railroads.	Union Pacific Railroad.	Central Pacific Railroad.	Total of Union and Central Pacific Railroads.	Total United States.
2, 873. 51	82, 459. 30	1, 042. 40	1, 213. 55	2, 255. 95	84, 715. 25
277. 76	19, 851. 24	20	100. 47	189. 47	20, 040. 71
266	16, 680	178	226	404	17, 084
207	11, 627	121	261	382	12, 009
87	4, 422	41	56	97	4, 519
4, 191	472, 412	3, 211	4, 567	7, 778	480, 190
\$114, 080, 216 00	\$2, 388, 928, 145 00	\$35, 762, 300 00	\$54, 275, 500 00	\$91, 037, 800 00	\$2, 479, 965, 945 00
67, 728, 000 00	2, 119, 922, 873 00	77, 781, 512 00	84, 885, 680 00	162, 617, 192 00	2, 282, 540, 065 00
7, 807, 658 00	152, 668, 091 00	-----	4, 212, 961 00	4, 212, 961 00	156, 881, 052 00
189, 080, 874 00	4, 661, 519, 109 00	114, 483, 812 00	148, 374, 141 00	257, 867, 953 00	4, 919, 387, 062 00
\$173, 299, 083 00	\$4, 155, 378, 297 00	\$118, 061, 052 00	\$148, 051, 498 00	\$261, 182, 550 00	\$4, 416, 510, 847 00
2, 371. 40	80, 960. 82	1, 042. 20	2, 230. 00	3, 272. 20	84, 232. 52
\$19, 721, 157 00	\$498, 658, 758 00	\$13, 201, 078 00	\$17, 153, 163 00	\$30, 354, 241 00	\$528, 012, 990 00
4, 114, 767 00	292, 414, 044 00	5, 475, 508 00	11, 206, 728 00	16, 682, 231 00	308, 080, 275 00
6, 606, 590 00	206, 244, 714 00	7, 725, 575 00	5, 946, 435 00	13, 672, 010 00	219, 916, 724 00
\$3, 484, 440 00	\$105, 179, 038 00	\$3, 390, 595 00	\$3, 667, 885 00	\$7, 058, 480 00	\$112, 287, 518 00
5. 07	4. 96	4. 86	4. 82	4. 84	4. 91
\$584, 104 00	\$57, 848, 505 00	\$2, 204, 700 00	*\$1, 628, 265 00	\$3, 832, 965 00	\$61, 681, 470 00
. 05	2. 42	5. 99	3. 00	4. 21	2. 40

* Paid February, 1880.

subject to the following corrections, as made by said companies in statements furnished calendar year 1879.

Total stock and debt.	Cost of road and equipment.	Miles of road operated.	Gross earnings.	Working expenses, including taxes and rentals.	Net earnings.	Interest paid on bonds.	Per cent.	Dividends paid on stock.	Per cent.
Dollars.	Dollars.		Dollars.	Dollars.	Dollars.	Dollars.		Dollars.	
133, 698, 650 84	118, 632, 223 96	1, 038	13, 201, 077 66	5, 475, 503 44	7, 725, 574 22	3, 390, 595 36	6. 69	2, 204, 700 00	6
163, 242, 512 66	149, 051, 497 79	2, 319	17, 153, 163 16	11, 126, 247 36	6, 026, 915 86	3, 810, 362 46	6. 68	-----	---
296, 941, 163 50	261, 733, 721 75	3, 357	30, 354, 240 82	16, 601, 750 74	13, 752, 490 08	7, 200, 957 82	6. 68	2, 204, 700 00	6

APPENDIX V.

Annual report of the Texas and Pacific Railway Company for the year ending June 30, 1878.

The Texas and Pacific Railway Company was chartered by act of Congress March 3, 1871.

Capital stock:

Authorized	\$50,000,000
Issued	7,018,500
Full paid	7,018,500

Miles of road in operation.

	Main line.	Sidings.
Shreveport division: From Shreveport to Marshall	89.86	6.26
Southern division: From Marshall to Fort Worth	178.72	17.59
Jefferson division: From Marshall to Texarkana Junction	68.05	4.60
Transcontinental division: From Texarkana via Texarkana Junction to Sherman	155.12	10.89
Total road in operation	443.86	39.44

All of the 443.86 miles of road in operation, with the exception of 19 miles within the State of Louisiana, has been inspected by commissioners appointed by the government, and duly accepted by the President of the United States.

No extension of our lines of railway has been made during the past year. A full description of the lines surveyed between Marshall, Tex., and San Diego, Cal., has been filed in the Department of the Interior.

There is filed with this report a copy of the seventh annual report of the board of directors of the Texas and Pacific Railway Company to the stockholders, covering in detail the operations of the company for its fiscal year ending May 31, 1878.

TEXAS AND PACIFIC RAILWAY COMPANY.

Receipts from all sources, and how applied, for the year ending June 30, 1878.

On hand June 30, 1877: Material, \$177,942.08; cash, &c., \$74,800.41.... \$252,742 49

By receipts from—

Passengers.....	\$594,030 84
Freight.....	1,644,753 03
Express	24,370 73
Mail	30,979 65
Telegraph	17,145 00
Miscellaneous	5,292 50
	<u>\$2,316,571 75</u>

To payments for—

Conducting transportation	446,539 08
Motive power	360,655 43
Maintenance of way	481,574 92
Maintenance of cars	118,277 03
General expenses.....	41,283 20
	<u>1,448,329 66</u>

By net earnings from operating road..... 868,242 09

By receipts from other sources:

From first and consolidated mortgage bonds.....	\$390,462 74
From land and town-lot sales	22,290 38
From sundry sources	1,511 04
	<u>414,254 16</u>

Total..... 1,535,236 74

Against which there is charged—

Interest on bonded and floating debt.....	\$659,461 89
Taxes.....	56,910 15
Premium and insurance.....	33,376 03
Construction and equipment, and general expenditures.....	263,952 37
Land department.....	24,760 86
Paid account liabilities Philadelphia and Marshall offices.....	240,765 70
	<hr/>
	1,279,227 00

On hand June 30, 1878:

Cash.....	\$43,402 75
Material.....	159,792 63
Due from agents, &c.....	52,816 36
	<hr/>
	256,011 74
	<hr/>
	1,535,238 74

Financial condition of the Texas and Pacific Railway Company June 30, 1878.

LIABILITIES.

Capital stock.....	\$7,018,500 00
First mortgage, 6 per cent. gold construction bonds, limited to \$8,000 per mile of road, eastern division, payable March 1, 1905.....	3,552,000 00
Consolidated 6 per cent. gold construction bonds, \$17,000 per mile, eastern division, payable June 1, 1905.....	7,548,000 00
Income and land-grant 7 per cent. currency bonds, payable June 1, 1905, limited to an issue of \$8,908,000.....	6,472,000 00
Land-grant bonds, old issue.....	1,058,000 00
These bonds are in process of withdrawal by exchange for the new income and land-grant bonds.	
Unpaid coupons, land-grant bonds.....	189,315 00
A portion of this amount is under agreement to be funded in the new income and land-grant bonds at par.	
Fractional bond scrip, redeemable in bonds of the company at presentation.....	95,596 35
State of Texas, school-fund loan.....	189,130 10
Bills payable.....	298,365 23
Current balances, Philadelphia and Marshall offices.....	482,706 92
	<hr/>
	26,901,613 60

ASSETS.

First mortgage 6 per cent. gold bonds in Treasury.....	\$77,000 00
Consolidated 6 per cent. gold bonds in Treasury.....	63,000 00
Property account, bonds and stock.....	277,516 76
Bills and accounts receivable.....	77,464 20
Cash in treasury, Philadelphia and Marshall.....	43,402 75
Material on hand.....	159,792 63
	<hr/>
	698,176 34

Balance, against which there is 444 miles of constructed and equipped road and telegraph line, the value of which does not fully appear on our books because of unadjusted balances, but the construction account in our last annual report shows the cost to have been \$26,540,239.61. Also 4,716,000 acres of land in the State of Texas, a small portion only of which has been valued.

Equipment of the Texas and Pacific Railway Company June 30, 1878.

LOCOMOTIVES.

In running order.....	47
Used as stationary engine.....	1
Not in use.....	1
	<hr/>
Total locomotives.....	49

CARS.

Passenger:	
First class	14
Second class	14
Baggage combination	3
Directors	1
Baggage, mail, and express	11
Box	487
Stock	164
Caboose	31
Flat	295
Boarding	6
Wrecking	1
Pile driving	2
Total cars	1,029

Names and residences of officers and directors of the Texas and Pacific Railway Company June 30, 1878.

OFFICERS.

President: Thomas A. Scott, Philadelphia, Pa.
 Vice-president: Frank S. Bond, Philadelphia, Pa.
 Vice-president: John C. Brown, Pulaski, Tenn.
 Treasurer: Geo. D. Krumbhaar, Philadelphia, Pa.
 Secretary: Chas. E. Satterlee, Philadelphia, Pa.
 Assistant to president: James P. Scott, Philadelphia, Pa.
 General superintendent: George Noble, Marshall, Tex.
 Auditor: Thos. D. Maurer, Marshall, Tex.
 Land Commissioner: Wm. H. Abrams, Marshall, Tex.

DIRECTORS.

Thomas A. Scott, Philadelphia, Pa.	W. T. Walters, Baltimore, Md.
Frank S. Bond, Philadelphia, Pa.	W. C. Hall, Louisville, Ky.
John C. Brown, Pulaski, Tenn.	Alfred Gaither, Cincinnati, Ohio.
H. H. Houston, Philadelphia, Pa.	T. L. Nesmith, San Diego, Cal.
R. D. Barclay, Philadelphia, Pa.	W. S. McManus, Chester, Pa.
W. W. Keefer, Philadelphia.	Wm. Thaw, Pittsburgh, Pa.
Marshall O. Roberts, New York City.	W. M. Harrison, Jefferson, Texas.
Henry G. Stebbins, New York City.	

Names and residences of the stockholders of the Texas and Pacific Railway Company, June 30, 1878.

Thomas A. Scott, Philadelphia, Pa.	Frank S. Bond, in trust, Philadelphia, Pa.
H. H. Houston, Philadelphia, Pa.	Henry G. Stebbins, New York City.
W. W. Keefer, Philadelphia, Pa.	Marshall O. Roberts, New York City.
R. D. Barclay, Philadelphia, Pa.	H. W. Gray, New York City.
Frank S. Bond, Philadelphia, Pa.	W. S. McManus, Chester, Pa.
Trustees:	Wm. Thaw, Pittsburgh, Pa.
M. Baird, Philadelphia, Pa.	Alfred Gaither, Cincinnati, Ohio.
W. T. Walters, Philadelphia, Pa.	J. S. Harris, unknown.
Frank S. Bond, Philadelphia, Pa.	W. C. Hall, Louisville, Ky.
Alfred Gaither, Philadelphia, Pa.	W. M. Harrison, Jefferson, Tex.
Jno. McManus, Philadelphia, Pa.	T. L. Nesmith, San Diego, Cal.
California and Texas Railway Construction Company, Philadelphia, Pa.	John C. Brown, Pulaski, Tenn.
	W. T. Walters, Baltimore, Md.

Annual report of the Texas and Pacific Railway Company for the year ending June 30, 1879.

The Texas and Pacific Railway Company was chartered by act of Congress, March 3, 1871.

Capital stock:

Authorized	\$50,000,000
Issued	6,996,000
Full paid	6,996,000

Miles of road in operation.

	Main line.	Sidings.
Shreveport division: From Shreveport to Marshall	39.96	6.81
Southern division: From Marshall to Fort Worth	179.73	15.95
Jefferson division: From Marshall to Texarkana Junction	69.05	6.22
Transcontinental division: From Texarkana via Texarkana Junction to Sherman	155.12	12.22
Total	443.86	40.70

All of the 443.86 miles of road in operation, with the exception of 19 miles within the State of Louisiana, has been inspected by commissioners appointed by the government, and duly accepted by the President of the United States.

A full description of the line surveyed between Marshall, Tex., and San Diego, Cal., has been filed in the Department of the Interior.

The company have under contract 31 miles of road, which at this date is nearly completed ready for the rails.

There is filed with this report a copy of the eighth annual report of the board of directors of the Texas and Pacific Railway Company to the stockholders, covering in detail the operations of the company for its fiscal year ending May 31, 1879.

Receipts from all sources and how applied for the year ending June 30, 1879.

On hand June 30, 1878:

Material	\$159,792 63	
Cash on accounts received	96,094 11	
		\$255,886 74

By receipts from—

Passengers	448,502 49	
Freight	1,587,584 02	
Express	20,010 58	
Mail	59,790 10	
Telegraph	12,263 65	
Miscellaneous	4,533 00	
		2,132,683 84

To payments for—

Conducting transportation	\$414,164 32	
Motive power	307,271 18	
Maintenance of cars	83,398 34	
Maintenance of way	539,994 03	
General expense	42,785 17	
		\$1,387,613 04

By net earnings from operating road

\$745,070 80

By receipts from other sources—

Town lot sales	2,286 09	
Interest and dividends on securities held by the company	74,597 96	
Receipts from sundry sources	786 36	
		77,670 41

Total

1,078,627 95

Against which there is charged—

Interest on bonded and floating debt	\$343,840 16	
Taxes	53,305 87	
Insurance	16,500 00	
Land department	\$100,095 21	
Less sales of land	28,838 94	
		71,256 27

Paid account reduction liabilities

109,662 36

Construction, equipment, and general expenses

280,102 61

874,667 27

On hand June 30, 1879 :

Cash	\$50,610 29
Material	98,964 96
Due from agents, &c.....	54,385 43
	<hr/>
	\$203,960 68

Total \$1,078,627 95

Financial condition of the Texas and Pacific Railway Company, June 30, 1879.

LIABILITIES.

Capital stock	\$6,996,000 00
First mortgage 6 per cent. gold construction bonds, limited to \$8,000 per mile of road, eastern division, payable March 1, 1905	3,552,000 00
Consolidated 6 per cent. gold construction bonds, \$17,000 per mile, eastern division, payable June 1, 1905.....	7,548,000 00
Income and land grant 7 per cent. currency bonds, payable June 1, 1905, limited to an issue of \$8,908,000.....	6,994,000 00
Land-grant bonds, old issue.....	773,000 00
Unpaid coupons land-grant bonds.....	289,625 00
Fractional bond scrip and redeemable in bonds of the company on presentation	99,225 31
Sale of Texas school-fund loan.....	185,366 42
Unpaid coupons, first and second mortgage bonds.....	2,970 00
Bills payable.....	257,188 82
Sinking funds first mortgage bonds	71,040 00
Special deferred loan	587,097 11
Current balances Philadelphia and Marshall offices.....	335,301 95
	<hr/>
	27,690,814 61

ASSETS.

First mortgage 6 per cent. gold bonds in Treasury.....	\$77,000 00
Consolidated mortgage gold bonds in Treasury.....	63,000 00
Property account bonds and stock.....	327,201 50
Bills and accounts receivable.....	70,143 43
Cash in treasury.....	50,610 29
Land department expenditures.....	320,872 32
Material on hand.....	98,964 96
	<hr/>
	1,007,792 50

Add 444 miles of constructed and equipped road and telegraph line, the value of which does not fully appear on our books because of unadjusted balances, but the construction accounts show an expenditure of \$26,906,900.81. Also 4,756,130 acres of land in the State of Texas, a portion only of which has been valued.

Equipment of the Texas and Pacific Railway Company, June 30, 1879.

LOCOMOTIVES.

In passenger service.....	9
In freight service.....	24
In work service	7
Switching service.....	4
Worn out	1
Being changed from broad gauge.....	1
	<hr/>
Total	49

CARS.

Passenger coaches, first class.....	12
Passenger coaches, second class.....	14
Directors	1
Passenger and baggage combination	1
First and second class combination	1
Baggage	1
Baggage and mail combination	2

Baggage and passenger combination.....	1
Baggage and express combination.....	9
Box cars	483
Stock	160
Flat	288
Caboose.....	31
Boarding	6
Wrecking	2
Pile driving.....	2
Total.....	1,014

Names and residences of the Texas and Pacific Railway Company stockholders, June 30, 1879.

Thomas A. Scott, Philadelphia, Pa.	H. G. Stebbins, New York City.
H. H. Houston, Philadelphia, Pa.	Marshall O. Roberts, New York City.
W. W. Keefer, Philadelphia, Pa.	W. S. McManus, Chester, Pa.
R. D. Barclay, Philadelphia, Pa.	William Thaw, Pittsburgh, Pa.
Trustees:	Alfred Gaither, Cincinnati, Ohio.
M. Baird, Philadelphia, Pa.	J. S. Harris, unknown.
W. T. Walters, Philadelphia, Pa.	W. C. Hall, Louisville, Ky.
Frank S. Bond, Philadelphia, Pa.	B. M. Johnson, Shreveport, La.
Alfred Gaither, Philadelphia, Pa.	W. M. Harrison, Jefferson, Tex.
Jno. McManus, Philadelphia, Pa.	T. L. Nesmith, San Diego, Cal.
California and Texas Railway Construc-	Frank S. Bond, Marshall, Tex.
tion Company, Philadelphia, Pa.	John C. Brown, Pulaski, Tenn.
Frank S. Bond, in trust, Philadelphia, Pa.	W. T. Walters, Baltimore, Md.

Names and residences of officers and directors of the Texas and Pacific Railroad Company.

OFFICERS.

President: Thomas A. Scott, Philadelphia, Pa.
 Vice-president: Frank S. Bond, Marshall, Tex.
 Vice-president: John C. Brown, Pulaski, Tenn.
 Treasurer: George D. Krummbhaar, Philadelphia, Pa.
 Assistant to president: James P. Scott, Philadelphia, Pa.
 Secretary: C. E. Satterlee, Philadelphia, Pa.
 General superintendent: George Noble, Marshall, Tex.
 Auditor: Thomas D. Maurer, Marshall, Tex.
 Land commissioner: William H. Abrams, Marshall, Tex.

DIRECTORS.

Thomas A. Scott, Philadelphia, Pa.	B. M. Johnson, Shreveport, La.
Frank S. Bond, Marshall, Tex.	William Thaw, Pittsburgh, Pa.
H. H. Houston, Philadelphia, Pa.	J. C. Brown, Pulaski, Tenn.
R. D. Barclay, Philadelphia, Pa.	W. C. Hall, Louisville, Ky.
W. W. Keefer, Philadelphia, Pa.	T. L. Nesmith, San Diego, Cal.
W. M. Harrison, Jefferson, Tex.	Alfred Gaither, Cincinnati, Ohio.
M. O. Roberts, New York City.	W. T. Walters, Baltimore, Md.
H. G. Stebbins, New York City.	

TABLE No. 1.—

Names of companies.	Incorporated or consolidated.	Consolidated with—	Previous incorporation.
			Name of company.
Union Pacific R. W. Co.	Jan. 26, 1880	Kansas Pacific R. W. Co. Denver Pacific R. W. and Telegraph Co. The Kansas Pacific R. W. Co. was successor, June 9, 1863, to Kansas Pacific R. W. Co., Eastern Div'n, which was successor to Leavenworth, Pawnee & West'n R. R. Co.	Union Pacific R. W. Co. Kansas Pacific R. W. Co. Denver Pacific R. W. and Telegraph Co.
Central Pacific R. R. Co.	Aug. 22, 1870	{ California and Oregon R. R. Co. San Francisco, Oakland and Alameda R. R. Co. San Joaquin Valley R. R. Co. }	Central Pacific R. R. Co.
San Francisco and Oakland R. R. Co.	June 29, 1870	San Francisco and Alameda R. R. Co., under the title of San Francisco, Oakland and Alameda R. R. Co.	.....
Central Pacific R. R. Co.	June 23, 1870	Western Pacific R. R. Co.	Central Pacific R. R. Co.
Western Pacific R. R. Co.	Nov. 2, 1869	San Francisco Bay R. R. Co.	Western Pacific R. R. Co.
San Francisco and Alameda R. R. Co.	Oct. 15, 1868	San Francisco, Alameda and Stockton R. R. Co.	San Francisco and Alameda R. R. Co.
California and Oregon R. R. Co.	Dec. 18, 1869	Yuba R. R. Co.	California and Oregon R. R. Co.
California and Oregon R. R. Co.	Jan. 16, 1868	Marysville R. R. Co. ....	.....do
			Marysville R. R. Co.
			San Joaquin Valley R. R. Co.
			San Francisco Bay R. R. Co..
			San Francisco, Alameda, and Stockton.
			Yuba R. R. Co.
			San Francisco and Oakland R. R. Co.
			Central Pacific R. R. Co. (amended.)
Central Branch Union Pacific R. R. Co.	Jan. 1, 1867	(On June 9, 1863, the Hannibal and Saint Joseph R. R. Co. assigned all its rights under act of July 1, 1862.)	Atchison and Pike's Peak R. R. Co.
Sioux City and Pacific R. R. Co.	Sept. 15, 1868	Northern Nebraska Air-Line R. R. Co.	Sioux City and Pacific R. R. Co.
Burlington and Missouri River R. R. Co. in Nebraska.	May 12, 1869	.....	.....
		♦	
Texas and Pacific R. W. Co.	May 2, 1872	Southern Pacific R. R. Co. (March 21, 1872). Southern Transcontinental R. R. Co. (March 30, 1872). Memphis, El Paso and Pacific R. R. Co.	Texas Pacific R. R. Co.
Southern Pacific R. R. Co.	Dec. 18, 1874	San Francisco and San José R. R. Co. (October 12, 1870). Santa Clara and Pajaro Valley R. R. Co. (Oct. 12, 1870). California Southern R. R. Co. (October 12, 1870). Southern Pacific Branch R. R. Co. (August 19, 1873). Los Angeles and San Pedro R. R. Co. (Dec. 18, 1874).	Southern Pacific R. R. Co. of California.

Organization.

Previous incorporation.	Road owned.	Roads leased, controlled, or operated.			Total miles operated.
Date.	Miles.	Names.	Miles.	Terms.	
July 1, 1862 Mar. 3, 1869 — —, 1855 — —, 1855 Nov. 19, 1867	1,814.848	No roads leased, but branch lines and extensions amounting to 1,222 miles are operated under this company's management for the benefit of the stockholders.	1,222	Earnings applied to payment of interest on bonds; surplus to income account.	3,036.848
June 23, 1870	1,204.50	From Union Pacific R. R. Co. From Southern Pacific R. R. Co. From Western Development Co.	5 550.20 .13	999 years. At amount of Union Pacific net earnings per mile. 60 days' notice. At \$6,000 per mile per annum less \$3,000 per mile per annum for operating expenses. \$1,000 per month	
June 28, 1861 Dec. 13, 1862 Mar. 25, 1863 Jan. 16, 1868 June 30, 1865 Nov. 29, 1867 Feb. 5, 1868 Sept. 25, 1868 Dec. 8, 1863		From Southern Pacific R. R. Co., of Arizona. From Los Angeles and San Diego R. R. Co. From Los Angeles and Independence R. R. Co. From Sacramento and Placerville R. R. Co. From Stockton and Copperopolis R. R. Co. From Amador Branch R. R. Co. From Berkeley Branch R. R. Co. From Northern R. W. Co.	293.93 27.60 16.83 5.64 49 27.2 3.84 112.6	\$1,500 per mile per annum. 60 days' notice. Net receipts. Notice. \$26,628.90 for the year. Trackage. At notice. \$7,200 per annum. 30 years. Principal and interest \$500,000, 5 per cent. 30-year bonds, &c. At notice. \$40,500 per annum. At notice. \$6,000 per annum. At notice. \$47,500 per month for this road and the S. P. and T.—below named.	2,456.43
Nov. 17, 1862 Oct. 21, 1861 Oct. 8, 1864		From California Pacific R. R. Co. From San Pablo and Tulare R. R. Co.	113.44 46.52	30 years. \$600,000 per annum, and three-fourths net earnings in excess of that amount. This road and the Northern Railway together are paid \$47,500 per month.	
Feb. 11, 1859	100	From Atchison, Colorado and Pacific R. R. Co.	261	Not furnished; roads operated by Missouri Pacific R. W. Co.	
Aug. 1, 1864	107.42	From Fremont, Elkhorn and Missouri Valley R. R. Co.	109.99	20 years. 33½ per cent. of gross earnings and taxes.	217.41
	180.5	From Nebraska R. R. Co. From Omaha and Southwestern R. R. Co.	177.5 46.6	Not given In perpetuity. 8 per cent. on \$1,034,000. Bonds guaranteed.	815.1
		From Atchison and Nebraska R. R. Co. From Republic'n V'y R. R. Co.	220.5 180	Not given do	
Mar. 3, 1871	483.86				483.86
Dec. 2, 1865	711.56	To Central Pacific R. R. Co. From Monterey R. R. Co.	550.20 15.4	See Central Pacific above. A new lease was made January 1, 1880, to expire in five years or until connection with Eastern roads, at \$250 per mile per month, net. April 22, 1880. 60 days' notice. \$20,400 per annum.	176.76

TABLE No. 1.—*Organ*

Names of companies.	Incorporated or consolidated.	Consolidated with—	Previous incorporation.
			Name of company.
Northern Pacific R. R. Co.	July 2, 1864	(Reorganized September 29, 1875 by the bondholders, after purchase at foreclosure sale August 12, 1875).	
Atlantic and Pacific R. R. Co.	July 27, 1866	(Road in Missouri purchased by St. Louis and San Francisco R. W. Co. Nov. 2, 1876).	
Saint Louis and San Francisco R. W. Co.	Sept. 7, 1876	Joplin R. R. Co. (May 26, 1879).	Atlantic and Pacific R. R. Co.
Oregon and California R. R. Co.	Mar. 16, 1870	Missouri Western R. R. Co. (August 1, 1879).	
Oregon Central R. R. Co.	Nov. 21, 1866		Oregon Central R. R. Co. of Salem.
Hannibal and Saint Joseph R. R. Co.	Feb. 14, 1870	Quincy and Palmyra R. R. Co. (March 14, 1867).	
		Kansas City and Cameron R. R. Co.	
Missouri Pacific R. W. Co.	Oct. 26, 1876	Sold under foreclosure, September 6, 1876.	Pacific R. R. Co. of Missouri.
Saint Louis, Iron Mountain and Southern R. W. Co.	May 6, 1874	Arkansas Branch R. R. Co.	Saint Louis, Iron Mountain and Southern R. R. Co.
		Cairo and Fulton R. R. Co.	
		Cairo, Arkansas and Texas R. R. Co.	
Little Rock and Fort Smith R. W. Co.			Little Rock and Fort Smith R. R. Co.
Memphis and Little Rock R. R. Co.			
Missouri, Kansas and Texas R. W. Co.	Apr. 7, 1870		Union Pacific R. R. Co. (Southern Branch).
			Tebo and Neosho R. R. Co.
			Labette and Sedalia R. R. Co.
			Neosho Valley and Holden R. R. Co.
Atchison, Topeka and Santa Fé R. R. Co.	Mar. 3, 1863	St. Louis & Santa Fé R. R. Co.	Atchison and Topeka R. R. Co.
		Hannibal and Central Missouri R. R. Co.	

* Of undivided half of road

isation—Continued.

Previous incorporation.	Road owned.	Roads leased, controlled, or operated.			Total miles operated.
Date.	Miles.	Names.	Miles.	Terms.	
.....	621.1 *34	Western Railroad of Minnesota. Saint Paul, Minneapolis and Manitoba R. W. Co.	61 75	99 years. 35 per cent. of gross earnings. Perpetual right to track. \$40,000 per annum, and a proportion of maintenance and station expenses.	781.1
.....	34	Operated by Saint Louis and San Francisco R. W. Co.	34	Maintenance of roadway and track.	
July 27, 1866	414	From Saint Louis, Wichita and Western R. R. Co.	145	Terms not given	630
.....		From Atlantic and Pacific R. R. Co.	34	Maintenance of roadway and track.	
.....		From Missouri Pacific R. W. Co.	37	Trackage. Nearly \$6,000 per mile per annum.	
July 25, 1866	197.36	.....	.....	.....	197.36
.....	46.7	To Western Oregon R. R. Co	.....	Not given	.....
Feb. 16, 1847	292.35	Central Branch Union Pacific and Leased Lines. Kansas City & Eastern R. W. Saint Louis, Kansas and Arizona R. R.	361 42 123	Operated by the Missouri Pacific for the owners.	292.35
Mar. 12, 1849	294.58	From Osage Valley and Southern Kansas R. R. Co. From Saint Louis and Lexington R. R. Co. From Missouri River R. R. Co. From Leavenworth, Atchison and Northwestern.	25 55.25 25.25 21.50	Not given.....do.....do.....do	947.58
Jan. 12, 1867	684.5	From Hot Springs R. R. Co.	25	.....do	709.5
.....	165.16	.....	.....	.....	165.16
.....	133	.....	.....	.....	133
Sept. 20, 1865	732	From Denison and Southeastern R. R. Co.	20	Not given	793.5
June 18, 1870	.....	From Denison and Pacific R. R. Co.	41.5	.....do	
May 7, 1870	.....	.....	.....	.....	.....
Dec. 1, 1879	.....	.....	.....	.....	.....
Feb. 7, 1867	.....	.....	.....	.....	.....
Feb. 11, 1850	470.58	From Pueblo and Arkansas Valley R. R. Co. From Wichita and Southwestern R. R. Co. From Kansas City, Topeka and Western R. R. Co. From Florence, El Dorado and Walnut Valley R. R. Co. From Pleasant Hill and De Soto R. R. Co. From Kansas City, Emporia and Southern R. R. Co. From Elk and Chatauqua R. R. Co. From Marion and McPherson R. R. Co. From Cowley, Sumner and Fort Smith R. R. Co. From New Mexico and South Pacific R. R. Co.	230.35 27.28 66.32 29.32 44.89 63.70 12.20 78.00 88.72 282.44	35 per cent. of gross earnings, less 5 per cent. rebate on all business to or from leased road and 15 per cent. of taxes. 35 per cent. of gross earnings, and 35 per cent. of taxes. 34 per cent. of gross earnings, and 34 per cent. of taxes. Not given.....do.....do.....do.....do.....do.....do.....do	1,393.8

from Duluth to Thomson.

TABLE NO. 1.—*Organ*

Names of companies.	Incorporated or consolidated.	Consolidated with—	Previous incorporation.
			Name of company.
Kansas City, Lawrence and Southern R. R. Co.	Apr. 1, 1879	Leavenworth, Lawrence and Galveston R. R. Co. Kansas City and Santa Fé R. R. Co. Southern Kansas R. R. Co.	Leavenworth, Lawrence and Galveston R. R. Co.
Saint Joseph and Western R. R. Co.	Mar. 29, 1877	Hastings and Grand Island R. R. Co.	Marysville, Palmetto and Roseport R. R. Co. Saint Joseph and Denver City R. R. Co. Saint Joseph and Pacific R. R. Co. Kansas and Nebraska R. R. Co.
Chicago, Burlington and Quincy R. R. Co.	Jan. 1, 1873		Burlington and Missouri River R. R. Co.
Chicago, Rock Island and Pacific R. R. Co.	Aug. 20, 1866		Mississippi and Missouri River R. R. Co.
Cedar Rapids and Missouri River R. R. Co.	June 14, 1859		
Dubuque and Sioux City R. R. Co.	Aug. 21, 1860		Dubuque and Pacific R. R. Co.
Iowa Falls and Sioux City R. R. Co.	Oct. 1, 1867		
Winona and Saint Peter R. R. Co.	Mar. 10, 1862		Transit R. R. Co.
Southern Minnesota R. W. Co.	Mar. 3, 1877		Root River Valley and Southern Minnesota R. R. Co.
Saint Paul and Duluth R. R. Co.	June 27, 1877		Lake Superior and Mississippi River R. R. Co.
Saint Paul, Minneapolis and Manitoba R. W. Co.	May 23, 1879		Saint Paul and Pacific R. R. Co.
			Red River and Manitoba R. R. Co.
Stillwater and Saint Paul R. R. Co.	May 8, 1870		
Chicago, Milwaukee and Saint Paul R. W. Co.	June —, 1863	McGregor and Missouri River R. R. Co., 1868 (150). Hastings and Dakota R. R. Co. (75). La Crosse and Milwaukee R. R. Co. (62). Minnesota Central R. R. Co. (110).	Milwaukee and Waukesha R. R. Co.
Wisconsin Central R. R. Co.	— —, 1853		
Vicksburg, Shreveport and Pacific R. R. Co.	Apr. —, 1853		
Chicago, Saint Paul, Minneapolis and Omaha R. W. Co.		Saint Paul and Sioux City R. R. Co. North Wisconsin R. R. Co. Chicago, Saint Paul and Minneapolis R. R. Co. Omaha and Northern Nebraska R. R. Co.	Not reported.

ization—Continued.

Previous incorporation.	Road owned.	Roads leased, controlled, or operated.			Total miles operated.
Date.	Miles.	Names.	Miles.	Terms.	
.....	184.74	From Southern Kansas and Western R. R. Co.	122.00	30 years.....	306.74
Feb. 17, 1857	251	{ Operated by Union Pacific R. W. Co. for the owners. }			
Apr. 17, 1862					
Nov. —, 1875					
— —, 1856	279				
	1,481.4	Leased lines reported.....	96.9		1,857.3
					1,311
	274.01	To Chicago and Northwestern R. W. Co.	271.6	About 33½ per cent. of gross earnings.	
Nov. 24, 1856	142.69	To Illinois Central R. R. Co.	142.89	20 years, with privilege of perpetuity; 36 per cent. of gross earnings.	
	183.69	To Illinois Central R. R. Co.	183.69	35 per cent. of gross earnings, and 10 per cent. drawback.	
Mar. 3, 1855	319.96	Owned and operated by Chicago and Northwestern R. W. Co.			
Mar. 2, 1855	167.5	To Chicago, Milwaukee and Saint Paul R. W. Co.	167.5	Not given.....	
May 23, 1857	162	From Stillwater and Saint Paul R. R. Co.	13	\$20,000 per annum.....	175
May 22, 1857	653	To Northern Pacific R. R. Co.	75.5	Perpetual right to joint use of track; amount equal to gross receipts.	653
Aug. 13, 1877					
	13	To Saint Paul and Duluth R. R. Co.	13	\$20,000 per annum.....	
Feb. 11, 1847					3,000.3
	326.73	{ From Chicago, Milwaukee and Saint Paul R. W. Co. From Milwaukee and Northern R. R. Co. To Texas and Pacific R. W. Co.	9	Use of track.....	455.73
			120	Not given.....	
	93		20	To be returned by the Texas and Pacific R. W. Co. Jan. 1, 1885, in good running order, equipped with 3 locomotives, 1 coach, 1 baggage, 1 box, and 18 flat cars.	73
		Not reported.....		Not reported.....	770

TABLE No. 2.—

Name of companies.	Number of stock holders.	Par value of shares.
Union Pacific	1, 509	\$100 00
Central Pacific		100 00
Central Branch Union Pacific	27	100 00
Sioux City and Pacific	136	100 00
Burlington and Missouri River, in Nebraska		
Texas and Pacific	58	100 00
Southern Pacific	34	100 00
Northern Pacific	8, 000	100 00
Atlantic and Pacific		
Saint Louis and San Francisco		100 00
Oregon and California	7	100 00
Oregon Central	99	100 00
Hannibal and Saint Joseph		100 00
Missouri Pacific		100 00
Saint Louis, Iron Mountain and Southern		100 00
Little Rock and Fort Smith		
Memphis and Little Rock		100 00
Missouri, Kansas and Texas	412	100 00
Atchison, Topeka and Santa Fé		100 00
Kansas City, Lawrence and Southern		100 00
Saint Joseph and Western		
Chicago, Burlington and Quincy		100 00
Chicago, Rock Island and Pacific		100 00
Cedar Rapids and Missouri River	507	100 00
Dubuque and Sioux City		
Iowa Falls and Sioux City	231	100 00
Sioux City and Saint Paul		
Winona and Saint Peter	1	100 00
Saint Paul and Duluth	1, 200	100 00
Saint Paul, Minneapolis and Manitoba		100 00
Stillwater and Saint Paul		
Chicago, Milwaukee and Saint Paul	2, 391	
Wisconsin Central		
Vicksburg, Shreveport and Pacific		100 00

* \$51,000,000 worth of preferred stock was originally issued; the difference represents the amount received and redeemed.

† Of this amount \$4,114,762 has first preference.

Ownership.

Capital stock authorized.	Capital stock subscribed.	Capital stock issued.		Total issued.	Owned by company.
		Common.	Preferred.		
\$100,000,000 00	\$50,783,000 00	\$50,783,300 00	.....	\$50,783,300 00	\$928,584 18
100,000,000 00	62,608,800 00	62,608,800 00	.....	62,608,800 00	3,333,800 00
1,000,000 00	1,000,000 00	986,700 00	.....	986,700 00	.....
6,000,000 00	1,899,400 00	(7%) \$169,000 00	2,068,400 00	.....
50,000,000 00	8,653,500 00	.....	8,653,500 00	.....
90,000,000 00	38,122,000 00	36,763,900 00	.....	36,763,900 00	.....
100,000,000 00	100,000,000 00	49,000,000 00	(8%)*43,412,645 12	92,412,645 12	6,127,085 86
25,000,000 00	9,920,300 00	†13,883,162 00	23,803,462 00	.....
.....	20,000,000 00	.....	20,000,000 00	.....
5,000,000 00	5,000,000 00	.....	5,000,000 00	.....
.....	9,168,700 00	(7%) 5,068,024 00	14,251,724 00	.....
.....	300,000 00	500,000 00	800,000 00	.....
26,500,000 00	21,458,961 00	.....
2,800,000 00	1,300,000 00	.....	1,800,000 00	.....
28,465,000 00	21,405,000 00	17,779 35	21,422,779 35	.....
Cost of road	20,787,900 00	.....	20,787,900 00	.....
.....	2,940,000 00	.....	2,940,000 00	.....
.....	31,004,456 51	.....	31,004,456 51	.....
25,000,000 00	20,980,000 00	.....	20,980,000 00	.....
.....	6,850,400 00	(7%) 769,600 00	7,620,000 00	.....
6,000,000 00	4,623,500 00	.....	4,623,500 00	.....
.....	400,000 00	.....	400,000 00	.....
5,000,000 00	*4,055,327 48	(7%) 4,736,007 31	8,791,334 79	.....
12,000,000 00	15,000,000 00	.....	15,000,000 00	.....
.....	15,404,261 00	12,279,483 00	27,683,744 00	.....
.....	9,435,500 00	(7%) 2,000,000 00	11,435,500 00	.....
300,000 00

* The common stock was all issued in exchange for bonds and other securities of the Lake Superior and Mississippi Railroad Company under the plan of reorganization.

TABLE No. 3.—

Names of companies.	President.	Secretary.
Union Pacific Railway	Sidney Dillon	Henry McFarland
Central Pacific Railroad	Leland Stanford	E. H. Miller, Jr.
Central Branch Union Pacific Railroad	Sidney Dillon	Henry McFarland
Sioux City and Pacific Railroad	Oliver Ames	Philo E. Hall
Texas and Pacific Railway	Thomas A. Scott	C. E. Satterlee
Southern Pacific Railroad of California	Charles Crocker	J. L. Willcutt
Northern Pacific Railroad	Frederick Billings	Samuel Wilkeson
Atlantic and Pacific Railroad	Thomas Nickerson	(J. & W. Seligman, financial agents.)
Saint Louis and San Francisco Railway	E. F. Winslow	Calvin Littlefield
Burlington and Missouri River Railroad in Nebraska	George Tyson	J. N. Denison
Oregon and California Railroad	R. Koehler	A. G. Cunningham
Western Oregon Railroad	R. Koehler	J. Simon
Hannibal and Saint Joseph Railroad	William Dowd	J. A. Hilton
Saint Louis, Iron Mountain and Southern Railway	Hon. Thomas Allen	S. D. Barlow
Little Rock and Fort Smith Railway	J. H. Converse	J. W. Gay
Memphis and Little Rock Railroad	R. H. Dow	J. W. Goodwin
Missouri, Kansas and Texas Railway	Jay Gould	H. B. Henson
Atchison, Topeka and Santa Fé Railroad	T. Jefferson Coolidge	Edward Wilder
Saint Joseph and Western Railroad	William Bond	Alfred Mitchell
Chicago, Burlington and Quincy Railroad	J. M. Forbes	J. G. Walker
Chicago, Rock Island and Pacific Railroad	Hugh Riddle	F. H. Tows
Cedar Rapids and Missouri River Railroad	Horace Williams	P. E. Hall
Dubuque and Sioux City Railroad	Morris K. Jesup	C. H. Booth
Iowa Falls and Sioux City Railroad	Horace Williams	P. E. Hall
Chicago, Milwaukee and Saint Paul Railway	Hon. Alexander Mitchell	R. D. Jennings
Wisconsin Central Railroad	Charles L. Colby	(John H. Stewart and Edwin H. Abbot, trustees.)
Chicago, Saint Paul, Minneapolis and Omaha Railway	H. H. Porter	G. A. Hamilton
Winona and Saint Peter Railroad	Albert Keep	S. O. Howe
Southern Minnesota Railway	W. C. Van Horne	P. M. Meyers
Southern Minnesota Railway Extension	J. C. Easton	P. M. Meyers
Saint Paul and Duluth Railroad	J. P. Halsey	E. Q. Sewall
Saint Paul, Minneapolis and Manitoba Railway	George Stephen	Edward Sawyer
Vicksburg, Shreveport and Pacific Railroad	Edmund Richardson	H. R. Jackson
Missouri Pacific Railway	Jay Gould	William Arnold
Stillwater and Saint Paul Railroad	David Bronson	E. V. Comfort

Officers June 30, 1880.

Treasurer.	General executive officer.	General accounting officer.
Henry McFarland	S. H. H. Clark, general manager	Joseph W. Gannett, auditor.
E. W. Hopkins	A. N. Towne, general superintendent ..	W. H. Porter, auditor.
Henry McFarland	Road operated by the Missouri Pacific Railway Company.	
D. B. Kimball	P. E. Hall, general manager	Henry V. Ferguson, auditor.
Geo. D. Krumhaar	George Noble, general superintendent ..	Edward R. Murphy, auditor.
N. T. Smith	A. C. Bassett, superintendent	Geo. T. Folsom, general accountant.
Robert Lenox Belknap ..	{ J. W. Sprague, general superintendent Pacific division. H. E. Sargent, general manager East- ern division.	Charles N. Scott, auditor Pacific di- vision. R. M. Newport, auditor Eastern di- vision.
S. W. Reynolds	E. F. Winslow, vice-president and gen- eral manager.	
Calvin Littlefield	C. W. Rogers, general manager	A. Douglas, auditor.
J. N. Denison	A. E. Tousalin, general manager	C. D. Dorman, auditor.
A. G. Cunningham	I. Brandt, general superintendent	R. Koehler, auditor.
A. G. Cunningham	I. Brandt, general superintendent	A. G. Cunningham, auditor.
W. J. Hilton	John B. Carson, general manager	C. W. Winslow, auditor.
D. W. McWilliams	Arthur W. Soper, general superintend- ent.	J. W. Wallace, general auditor.
Joseph Kampman	Theo. Hartman, general superintendent ..	J. W. Gay, auditor.
J. W. Goodwin	Rudolph Fink, general manager	J. W. Goodwin, auditor.
A. D. Jaynes	A. Mitchell, general manager	P. E. Fairbanks, comptroller.
Edward Wilder	W. B. Strong, vice-president and gener- al manager.	John P. Whitehead, general auditor.
Alfred Mitchell	Road operated by Union Pacific Rail- way Company.	
A. T. Hall	Thomas J. Potter, general manager	J. L. Lathrop, general auditor.
F. H. Tows	A. Kimball, general superintendent	C. F. Jilson, auditor.
David P. Kimball	Road operated by Chicago and North- western Railway Company.	
J. E. Dumont	Road operated by Illinois Central Rail- road Company.	
D. P. Kimball	Road operated by Illinois Central Rail- road Company.	
R. D. Jernings	S. S. Merrill, general manager	J. P. Whaling, auditor.
.....	F. N. Finney, general manager	James Barker, auditor.
R. P. Flower	J. W. Bishop, general manager	C. D. W. Young, auditor.
M. L. Sykes	Road operated by Chicago and North- western Railway Company.	
Walton Ferguson	Road operated by Chicago, Milwaukee, and Saint Paul Railway Company.	
P. M. Meyers	Road operated by Chicago, Milwaukee, and Saint Paul Railway Company.	
E. Q. Sewall	Geo. H. Smith, general superintendent ..	F. S. Ilsley, auditor.
Edward Sawyer	James J. Hill, general manager	S. S. Breed, auditor.
H. R. Jackson	J. W. Green, general manager	Joseph F. McGuire, cashier.
A. H. Calef	A. A. Talmage, general superintendent ..	C. G. Warner, auditor.
E. Q. Sewall	Road operated by Saint Paul and Du- luth Railroad Company.	

TABLE No. 4—

Names of companies.	Opened for public use.	Length of main track owned.			Weight of rail per yard.		Length of side track.	Gauge. Feet. Inches.	Length of tangent lines.
		Steel.	Iron.	Total.	Steel.	Iron.			
		Miles.	Miles.	Miles.	Lbs.	Lbs.	Miles.		Miles.
Union Pacific R. W.	May 10, 1869	823	991.8	1,814.8	52-56 58-60	50-56	300	4 8½	.....
Central Pacific R. R.	May 10, 1869	462.4	742.1	1,204.5	50-60	50-56	199.1	4 8½	881.00
Central Branch Union Pacific R. R.	Oct. 1, 1868	.....	100	100	.....	50-56	11.59	4 8½	69.95
Sioux City and Pacific R. R.	Oct. 1, 1868	.....	107.42	107.42	.....	56	12.68	4 8½	97.21
Burlington and Missouri River R. R. in Nebraska	Sept. 2, 1872	.....	.....	190.5	.....	42-56	.....	4 8½	.....
Texas and Pacific R. W.	Aug. 11, 1876	56.60	427.26	483.86	56	56	42.68	4 8½	.....
Southern Pacific R. R. of California	—, 1877	389.23	321.86	711.09	50	56	53.33	4 8½	582.60
Northern Pacific R. R.	—, 1877	.....	.....	645.1	56	52-56	.....	4 8½	.....
Atlantic and Pacific R. R.	Sept. 1, 1871	.....	.....	84	.....	56	.....	4 8½	.....
Saint Louis and San Francisco R. W.	Sept. 1, 1871	130	163	293	56	56	.....	4 8½	.....
Oregon and California R. R.	Dec. 25, 1869	8	189.36	197.36	56	50-56	13.86	4 8½	152.52
Oregon Central R. R.	Nov. 1, 1871	.....	46.7	46.7	.....	50-56	2.76	4 8½	85.24
Hannibal and Saint Joseph R. R.	Feb. 22, 1869	177	115.35	292.35	56	56.60	.....	4 8½	.....
Missouri Pacific R. W.	Oct. 3, 1865	.....	.....	296.5	56	60	.....	4 9	.....
Saint Louis, Iron Mountain and Southern R. W. ....	.....	203.48	480.77	684.25	60	56-60	.....	4 8½	.....
Little Rock and Fort Smith R. W.	Jan. —, 1871	.....	.....	165.16	.....	56	.....	4 8½	.....
Memphis and Little Rock R. R.	—, 1874	.....	.....	133	56	60-72	5	.....	.....
Missouri, Kansas and Texas R. W.	.....	.....	.....	732	52	56	.....	4 8½	.....
Atchison, Topeka and Santa Fe R. R.	Aug. 1, 1870	.....	.....	470.58	52-56	56	64.62	4 8½	404.34
Kansas City, Lawrence and Southern R. R.	—, 1870	.....	.....	184.74	.....	57	.....	4 8½	.....
Saint Joseph and Western R. R.	—, 1871	.....	.....	251	.....	56	.....	4 8½	.....
Chicago, Burlington and Quincy R. R.	—, 1860	.....	.....	1,760.4	56-66	56	.....	4 8½	.....
Chicago, Rock Island and Pacific R. R.	June 9, 1869	.....	.....	.....	60	58	.....	4 8½	.....
Cedar Rapids and Missouri River R. R.	—, 1866	228.33	45.68	274.01	.....	.....	.....	4 8½	.....
Dubuque and Sioux City R. R.	Apr. 1, 1861	58.51	84.88	142.89	60	60	17.69	4 8½	.....
Iowa Falls and Sioux City R. R.	—, 1870	.....	183.69	183.69	.....	.....	11.99	4 8½	.....
Winona and Saint Peter R. R.	—, 1878	49.90	298.36	319.96	.....	.....	28.30	4 8½	272.64
Southern Minnesota R. W.	Dec. 25, 1870	.....	.....	167.5	52.5	50.5	.....	4 8½	.....
Saint Paul and Duluth R. R.	Aug. 1, 1870	.....	.....	162	.....	.....	.....	4 8½	.....
Saint Paul, Minneapolis and Man- itoba R. W.	Nov. 20, 1871	.....	.....	653	.....	.....	.....	4 8½	.....
Chicago, Milwaukee and Saint Paul R. W. ....	.....	617	.....	.....	60	56	.....	4 8½	.....
Wisconsin Central R. R.	—, 1876	.....	.....	326.73	.....	56.60	.....	4 8½	.....
Vicksburg, Shreveport and Pacific R. R. ....	.....	0.40	92.6	93	54	48.64	3.25	5 6	.....
Chicago, Saint Paul, Minneapolis and Omaha R. W.	Dec. 1, 1872	.....	.....	.....	.....	.....	.....	4 8½	.....

Characteristics of road.

Length of curved lines.			Length of level.			Length of grades.		Grade per mile.		Tunnels.		Bridges.		Trestles.		Number of culverts.	Miles of fencing.	Number of stations.	Number of turn-tables.	Number of engine-houses.	Number of water stations.	
Total curvature.			Ascending.			Descending.		Maximum.		Average.		Number.		Length.								Number.		Length.
Miles.	°	'	Miles.	Miles.	Miles.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.							
323.47	48,060.38	214.88	396.16	593.42	116.16	13.03	17	8,102	75	9,634	784	112,522	2,216	708.8	188	41	26	78	13			
130.05	1,025.13	38.99	21.27	47.16	52.80	11.24			3	570	130	11,556	3	7.18	15	3	3	7				
18.21					30																	
228.49	18,773.25	150.07	299.27	305.85	116.16	33.69	20	15,247	18	2,789	599	50,025	1,326	442	51	23	14	44				
44.84																						
11.46	1,688.41	11.60	21.76	23.34	198	42.3			3	27,027	54	41,420	877		36	6	3	8				
										200		13,404	79		12	2	1	3				
66.24	5,191.27	47.28	94.79	328.51	63.67														9	7	34	
			25.98	48.07	68.84	82.56	35			20	3,007	141	12,831	136	220.37	23	5	3	10			
			49.85	57.02	76.82	62.66	28.71			6	1,260	819	28,750	28	46.89	26	2	3	12			
47.32	3,712.49	87.35	105.09	127.52	89	33.3				23	3,132			201	384	44	9	12	22			
										14	2,245	122	22,770		62.3	30						
										10	754	118	17,316		50.5	28						
																			516			
										3	508		22,500						8	3	2	5

TABLE No. 5.—

Names of companies.	Miles of road owned.	Cost of construction.	Cost of equipment.	Total cost.
Union Pacific R. W.	1,814.84			\$154,485,642.29
Central Pacific R. R.	1,204.5	\$136,558,752.45	\$8,045,262.10	144,604,014.55
Central Branch Union Pacific R. R.	100			3,706,706.00
Sioux City and Pacific R. R.	107.42			5,355,551.28
Burlington and Missouri River R. R. Co. in Nebraska	190.50			20,541,852.14
Texas and Pacific R. W.	483.86			23,925,840.90
Southern Pacific R. R. Co. of California	711.09	62,919,109.72	1,848,533.51	64,767,643.23
Northern Pacific R. R.	621.1			88,470,624.95
Atlantic and Pacific R. R.	34			
Saint Louis and San Francisco R. W.	414			38,323,237.16
Oregon and California R. R.	197.36	4,873,369.96	590,434.80	5,463,804.76
Oregon Central R. R.	46.7	1,105,640.90	96,566.25	1,202,207.15
Hannibal and Saint Joseph R. R.	292.35	12,712,745.94	863,077.73	13,575,823.67
Missouri Pacific R. W.	294.58			15,842,390.81
Saint Louis, Iron Mountain and Southern R. W.	684.5			45,694,907.66
Little Rock and Fort Smith R. W.	165.16			
Memphis and Little Rock R. R.	133			4,419,584.07
Missouri, Kansas and Texas R. W.	732			44,561,117.77
Atchison, Topeka and Santa Fe R. R.	470.58			30,000,000.00
Kansas City, Lawrence and Southern R. R.	184.74			5,721,888.87
Saint Joseph and Western R. R.	251			5,449,620.77
Chicago, Burlington, and Quincy R. R.	1,760.4			69,244,012.78
Chicago, Rock Island and Pacific R. R.	1,311			35,682,201.83
Cedar Rapids and Missouri River R. R.	274.01			11,415,870.56
Dubuque and Sioux City R. R.	142.89			
Iowa Falls and Sioux City R. R.	183.69			7,585,000.00
Winona and Saint Peter R. R.	319.96			10,692,720.83
Southern Minnesota R. W.	167.5			6,424,100.00
Saint Paul and Duluth R. R.	163			9,208,864.38
Saint Paul, Minneapolis and Manitoba R. W.	653			
Chicago, Milwaukee and Saint Paul R. W.				64,669,194.36
Wisconsin Central R. R.	326.73			19,823,023.38
Wicksburg, Shreveport and Pacific R. R.	73			
Chicago, Saint Paul, Minneapolis and Omaha R. W.				9,845,248.63

* Made up from companies' reports and

Cost and equipment.*

Cost per mile.	Number of locomotives.	Number of cars.										Total.
		Passenger.	Sleeping.	Baggage and express.	Postal.	Box, freight, and stock.	Platform and coal.	Miscellaneous.	Service.	Hand.		
\$45,123 00	283	148	27	55	9	2,984	1,753	144	94	375	5,875	
120,053 00	226	220	41	46	10	2,551	2,016		258	486	5,638	
37,067 08												
49,841 00	13	9		5		109	45		11	68	247	
107,831 00												
59,792 00	54	31	1	11		641	337	30	9		1,060	
91,082 00	48	74	1	14		581	328	1	142	106	1,247	
142,442 00	71	23	4	15		683	795	251	37		1,808	
95,983 00	49	10		19		1,235	853		47		2,164	
27,684 00	14	9		6		207	52		12	35	321	
25,309 00	4	2		2		20	20		80	9	88	
46,437 00	78	30		16		1,137	392		96	58	1,729	
53,776 00	110	52		30		1,811	403		63		2,359	
66,756 00	121	47	1	24		1,562	1,029		53		2,716	
	10	6		2		112	107		5		232	
33,230 00	15	6		4		212					222	
60,875 00	90	31		20	5	1,372	421	1	81	325	2,359	
63,750 00	133	76		22	5	2,199	1,520		55	516	4,393	
30,972 00	19	12		8		311	140		10		481	
24,113 00	13	4		12		59	95				170	
39,334 00	374	145		70		8,412	2,415		582	457	12,681	
27,217 00	276	100	17	34	6	4,598	1,408		155	631	6,951	
41,682 00												
41,292 00									4	66	70	
33,103 00	27	7		2		893	133		2	32	1,060	
38,353 00	14	6		3		206	83		11	58	367	
58,857 00	24	10		4		371	151		21	75	632	
	46	34		16		404	302		21		777	
	344	149	14	101	8	6,946	1,845		68		9,131	
60,671 00	15	4	4	3		326	515		6		856	
	5	5	4	3		25	25		5	25	88	

other sources not verified by this office.

TABLE No. 6.—Statistics

UNION PACIFIC

Character of bond.	Payable in—	Rate per cent.	Interest payable—	Date of issue.	Term in years.	Amount issued.	Amount outstanding.
UNION DIVISION.							
First mortgage	Gold	6	Jan. 1 and July 1.	Jan. 1, 1866, to July, 1869.	30	\$27,237,000	\$27,229,000 00
Land-grant mortgage (1st mortgage).	Currency.	7	Apr. 1 and Oct. 1.	Apr., 1867, to 1869.	20	10,400,000	6,299,000 00
Omaha Bridge mortgage (1st mortgage).	Gold	8	Apr. 1 and Oct. 1.	Apr. 1, 1871	25	2,500,000	2,037,000 00
Sinking-fund mortgage (3d mortgage).	Currency.	8	Mar. 1 and Sept. 1.	Mar. 1, 1874	20	14,470,000	13,861,000 00
United States subsidy bonds, 2d mortgage.	Currency.	6	Jan. 1 and July 1.	Jan., 1866, to July, 1869.	30	27,236,512	27,236,512 00
Collateral trust	Currency	6	.....	....., 1879	29	.....	4,207,000 00
KANSAS DIVISION.							
First mortgage, Eastern Division.	Gold	6	Feb. 1 and Aug. 1.	Aug. 15, 1865	30	2,240,000	2,240,000 00
First mortgage, Middle Division.	Gold	6	June 1 and Dec. 1.	June 1, 1868	30	4,063,000	4,063,000 00
First mortgage, Denver Extension.	Gold	7	May 1 and Nov. 1.	June 20, 1869	30	6,500,000	6,371,000 00
Land-grant, 1st mortgage.	Currency	7	Mar. 1 and Sept. 1.	Mar. 1, 1865	5-10	500,000	.....
Do	Gold	7	{ Jan. 1 and July 1. }	July 1, 1870	10	2,000,000	861,000 00
Land-grant, 2d mortgage.	Gold	7	Mar. 1 and Sept. 1.	Aug. —, 1871	15	1,500,000	19,000 00
Leavenworth Branch, 1st mortgage.	Currency	7	May 1 and Nov. 1.	Jan. 1, 1866	30	600,000	342,000 00
Funding-interest certificates.	Currency	6	.....	Jan. 11, 1875	.....	.....	.....
Income mortgage (sub-ordinated).	Currency.	7	{ Mar. 1 and Sept. 1. }	July 1, 1866	50	4,275,350	1,095,250 00
Funding mortgage	Currency.	10	Apr. 1 and Oct. 1.	Oct. 2, 1876	3	1,500,000	.....
United States subsidy bonds.	Currency.	6	Jan. 1 and July 1.	Oct., 1865, to Oct., 1868.	30	6,303,000	6,303,000 00
First mortgage, Cheyenne Branch.	Currency.	7	.....	Apr. 10, 1869	30	2,222,000	438,000 00
Coupon certificates	Currency.	6	Jan. 1 and July 1.	July 1, 1879	29	.....	2,202,847 62
Consolidated (Kansas Division).	Currency.	6	May 1 and Nov. 1.	May 1, 1879	40	.....	11,169,260 00
						113,546,862	115,973,869 62

CENTRAL PACIFIC

Convertible	Gold	7	Jan. 1 and July 1.	Dec. 1, 1862	20	1,500,000	1,500,000 00
California State Aid	Gold	7	Jan. 1 and July 1.	July 1, 1864	20	1,500,000	1,500,000 00
First mortgage, A, B, C, D	Gold	6	Jan. 1 and July 1.	July 1, 1865, to July 1, 1866.	30	6,378,000	6,378,000 00

of bonded debt June 30, 1880.

RAILWAY COMPANY.

Annual interest payment.	Secured by—	Par value.	Sales June 30, 1880.	Sinking fund established.	Annual requirement for sinking funds.	Price payable for bonds.
\$1,633,740 00	Road and franchise.	\$1,000	\$1,152	July 1, 1878	See sinking-fund act, approved May 7, 1878.	
440,930 00	Granted lands	1,000	1,113	Apr. —, 1867	Proceeds of land sales.	Par or lowest terms.
162,960 00	Bridge	1,000		Apr. —, 1871	\$42,000 in gold	10 per cent. premium.
1,108,880 00	Road, franchises, and lands.	1,000	1,175	Sept. 1, 1875	1 per cent. of outstanding.	Par.
1,634,190 72	United States	1,000	1,230	July 1, 1878	See sinking-fund act, approved May 7, 1878.	
72,420 00						
134,400 00	140 miles main line, property, and income.	1,000	1,030	None		
243,740 00	254 miles main line, property, and income.	1,000		None		
445,970 00	244 miles of road, property, and income.	1,000	1,140	June —, 1869	Proceeds of sale of 3,000,000 acres granted land.	
	Granted lands	1,000				Redeemed and canceled.
60,270 00	{ 2,000,000 acres granted lands. }	{ 250 500 1,000 }	1,220	July 1, 1870	Proceeds of land ..	
1,330 00	.....do	1,000	965	Aug. —, 1871	.....do	
23,940 00	34 miles of branch road and franchises.	1,000	1,000			
	Income		780			
76,667 50	.....do	{ 100 250 1,000 }	760			
378,180 00	United States	1,000	1,230			Under control of the company.
	Secured by mortgage bonds of certain railroads.	1,000	1,118			
	\$24,000,000, on 673 miles road, franchises, and lands.	1,000	948			
5,597,658 20						

RAILROAD COMPANY.

105,000 00	50 miles of road east of Sacramento.	1,000	1863	\$35,000
(*)	Road from Sacramento to Stateline.	1,000	1,055	1870
382,680 00	Road and franchises between Sacramento and east line of State.	1,000	1,147	1870

* Paid by State of California.

TABLE No. 6.—*Statistics of bonded*

CENTRAL PACIFIC RAIL

Character of bond.	Payable in—	Rate per cent.	to— payable—	Date of issue	Term in years.	Amount issued.	Amount outstanding.
First mortgage, E, F, G, H, I.	Gold	6	Jan. 1 and July 1.	Jan. 1, 1867, to Jan. 1, 1868.	30	\$19,505,000	\$19,505,000 00
Western Pacific (old issue).	Gold	6	June 1 and Dec. 1.	Dec. 1, 1865	30	112,000	112,000 00
First mortgage, Western Pacific, A.	Gold	6	Jan. 1 and July 1.	July 1, 1869	30	1,858,000	1,858,000 00
First mortgage, Western Pacific, B.	Gold	6	Jan. 1 and July 1.	July 1, 1869	30	765,000	765,000 00
California and Oregon (1st mortgage), A.	Gold	6	Jan. 1 and July 1.	Jan. 1, 1868	30	6,000,000	6,000,000 00
Central Pacific, California and Oregon Division.	Gold	6	Jan. 1 and July 1.	Jan. 1, 1872	30	2,080,000	2,080,000 00
San Francisco, Oakland and Alameda.	Gold	8	Jan. 1 and July 1.	July 1, 1870	20	687,000	687,000 00
San Joaquin Valley (1st mortgage).	Gold	6	April 1 and Oct. 1.	Oct. 1, 1870	30	6,080,000	6,080,000 00
Income bonds.....		8	May 1 and Nov. 1.	May 1, 1878	10	3,285,000	3,285,000 00
Land-grant mortgage.....	Gold	6	April 1 and Oct. 1.	Oct. 1, 1880	20	10,000,000	7,080,000 00
United States subsidy bonds, Central Pacific.	Currency	6	Jan. 1 and July 1.	Jan., 1865, to July, 1869.	30	25,885,120	25,885,120 00
United States subsidy bonds, Western Pacific.	Currency	6	Jan. 1 and July 1.	Jan., 1867, to Jan., 1870.	30	1,970,560	1,970,560 00
						\$187,605,680	84,685,620 00

CENTRAL BRANCH UNION

First mortgage	Gold	6	May 1 and Nov. 1.	May, 1865	30	1,600,000	1,600,000 00
Funded interest bonds.....		7	April 1 and Oct. 1.	April 1, 1879	16	617,000	617,000 00
United States subsidy bonds.	Currency.	6	Jan. 1 and July 1.	July, 1866, to Jan., 1868.	30	1,600,000	1,600,000 00
						3,817,000	3,817,000 00

SIOUX CITY AND

First mortgage	Gold	6	Jan. 1 and July 1.	Jan. 1, 1868	30	1,628,000	1,628,000 00
United States subsidy bonds.	Currency.	6	{ Jan. 1 and July 1. }	{ Mar. 10, 1868 Mar. 30, 1868 Mar. 3, 1869 }	{ 30 }	{ 792,000 320,000 516,320 }	{ 1,628,320 00 }
						3,256,320	3,256,320 00

debt, June 30, 1880—Continued.

ROAD COMPANY—Continued.

Annual interest payment.	Secured by—	Par value.	Sales June 30, 1880.	Sinking fund established.	Annual requirement for sinking funds.	Price payable for bonds.
\$1,170,300 00	Road and franchises east of east line of State.	\$1,000	\$1,147	1872	\$50,000	
6,720 00	Road and franchises 100 miles east of San José.	1,000			\$112,000, 1st mortgage, series "A," retained to redeem these.	
111,480 00	Road and franchises between Sacramento and San José.	1,000	1,000	1876	\$25,000	
45,900 00	Road and franchises between Sacramento, Oakland, and San José.	1,000	1,000	1876		
360,000 00	Road and franchises from Central Pacific to Oregon State line.	1,000	1,050	1876		\$100,000
124,800 00	do	1,000		1876	\$100,000	
54,900 00	Property, franchises, and income.	1,000		1880	\$100,000	
364,800 00	Road and franchises between Lathrop and Visalia.	1,000	1,000	1880	\$50,000	
262,800 00	Income of road			1879	\$600,000	
424,800 00	Land granted by United States.	1,000		1870	Proceeds of sale.	
1,553,107 20	United States	1,000	1,230	July 1, 1878	See sinking-fund act, approved May 7, 1878.	
118,223 60	do	1,000	1,230	July 1, 1878	do	
5,085,580 80						

PACIFIC RAILROAD COMPANY.

98,000 00	100 miles of road and franchises.	1,000		None		
43,190 00		1,000				
98,000 00	United States	1,000	1,230	None		
223,190 00						

PACIFIC RAILROAD COMPANY.

97,680 00	101 $\frac{1}{2}$ miles of road and franchises.	1,000		None		
97,680 20	United States	1,000	1,230	None		
195,370 20						

TABLE No. 7.—*Liabilities and assets.*

	Dec. 31, 1879	Dec. 31, 1879	Kansas Pacific Rail-way Company.	Denver Pacific Rail-way and Telegraph Company.*	Union Pacific Railroad Company.	June 30, 1880	June 30, 1880	Central Pacific Rail-road Company.	Central Branch Union Pacific Railroad Company.	St. Louis City and Pacific Railroad Company.	Burlington and Mis-souri River Railroad in Nebraska.*	Texas and Pacific Rail-way Company.		
LIABILITIES.														
Due to United States for bonds loaned	\$27,236,512 00	\$6,303,000 00				\$23,539,512 00	\$27,855,680 00	\$1,600,000 00	\$1,600,000 00	\$1,628,320 00				
Interest due and accrued on United States bonds	19,238,182 89	3,723,553 17				25,050,071 34	20,106,781 81	1,281,808 26	1,281,808 26	\$1,171,199 89				
Other bonded debt	50,972,000 00	24,373,825 12				52,434,357 62	56,830,000 00	2,225,218 14	2,225,218 14	1,628,000 00		\$20,418,967 68		
Interest due and accrued	888,481 06	1,090,450 55				1,163,402 88	1,484,345 00	5,221 87	5,221 87	51,165 00		2,122,720 00		
Pay rolls and vouchers	837,781 04	728,328 02				1,091,486 34		5,911 36	5,911 36	74,140 22				
Bills payable	705,664 81	468,225 38				2,894,308 60	780,807 19	244,442 14	244,442 14	19,130 00		231,677 64		
Accounts and dividends payable	2,233,223 75	3,241,874 67				2,432,230 72	5,153,176 35	313,365 59	313,365 59	185,321 83		166,943 79		
Capital stock	36,762,300 00	9,689,950 00				50,762,300 00	59,275,500 00	1,000,000 00	1,000,000 00	2,068,400 00		8,653,500 00		
Surplus	2,473,770 82					1,974,739 39								
Total	141,358,015 87	49,619,206 91				201,942,468 89	171,406,290 35	6,655,967 36	6,655,967 36	6,825,676 94		31,563,839 11		
ASSETS.														
Cost of road and fixtures	118,682,223 96	34,359,540 66				154,485,642 29	136,558,752 45	3,962,974 75	3,962,974 75	5,355,551 28		28,925,840 90		
Machinery, locomotives and cars							8,045,262 10							
Real estate other than road	16,345 78	176,996 44				77,949 60	2,560,396 81					406,908 50		
Fuel, materials, and supplies	1,086,689 99	697,229 34				1,850,669 82	1,932,696 76			51,012 04		166,925 42		
Cash	490,708 37	897,239 80				2,047,329 79	1,855,357 31	11,587 50	11,587 50	44,638 52		56,968 65		
Company's bonds and stocks	202,185 53	\$3,850,098 80				1,320,685 60	7,259 20	15,400 00	15,400 00	5,000 00				
Other bonds and stocks and investments in other corporations	7,226,033 39					15,338,453 94	2,326,763 11	120,245 80	120,245 80	14,130 00				
Bills receivable	59,500 00	295,526 99				78,194 74	1,877,773 56	430,978 47	430,978 47			\$85,219 34		
Accounts receivable	3,767,967 72	294,279 76				7,121,617 87	786,795 65	42,281 97	42,281 97	154,103 02				
Interest repaid to the United States.	5,185,394 71					6,802,008 31		54,548 60	54,548 60					
Due from United States	4,641,243 30	1,487,900 95				5,818,752 21	\$4,929,239 82	18,573 65	18,573 65	120,021 98				
United States sinking fund						538,327 51								
Sinking funds in hands of trustees	613 12	1,525,664 44				613 12	4,187,176 65							
Land contracts, land cash, &c.														
Deficit						6,462,224 09		6,428,816 84	1,999,376 53	1,081,220 10		1,949,036 30		
Total	141,358,015 87	49,619,206 91				201,942,468 89	171,406,290 35	6,655,967 36	6,655,967 36	6,825,676 94		31,563,839 11		
													* No statement.	
													† Including other stocks and bonds.	
													‡ Including United States sinking fund.	

TABLE No. 7.—*Liabilities and assets*—Continued.

	Southern Pacific Rail- road Company.		Northern Pacific Rail- road Company.		Saint Louis and San Francisco Railway Company.		Oregon and California Railroad Company.		Hannibal and Saint Joseph Railroad Com- pany.		Missouri Pacific Rail- way Company.		Saint Louis, Iron Moun- tain and Southern Railway Company.		Little Rock and Fort Smith Railway Com- pany.*		Memphis and Little Rock Railroad Com- pany.*	
	June 30, 1880	June 30, 1880	June 30, 1880	June 30, 1880	June 30, 1880	June 30, 1880	June 30, 1880	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879	Dec. 31, 1879
LIABILITIES.																		
Bonded debt.....	\$28,872 00	\$3,881,834 41	\$16,771,286 94	\$10,950,000 00	\$8,633,000 00	\$15,123,000 00	\$31,176,907 50											
Interest due and accrued.....	652,530 00		226,513 56	767,788 04	136,080 00	342,318 63	1,085,111 02											
Pay-rolls and vouchers.....	60,874 86			17,183 04	1,217 83	274,118 06	189,872 03											
Bills payable.....			245,000 00	133,629 48	91,125 00	6,703 84	91,883 82											
Accounts and dividends payable.....	493,940 21	915,883 63	387,946 27		152,224 61	52,831 69	207,234 04											
Capital stock.....	36,763,900 00	92,412,645 12	23,863,482 00		14,251,724 01	800,000 00	21,458,961 00											
Surplus.....		1,144,384 79	262,026 39			1,538,572 39												
Total.....	66,843,245 07	98,844,731 42	41,600,239 12	11,868,602 52	23,285,371 46	18,157,542 83	54,219,959 41											
ASSETS.																		
Cost of road and fixtures.....	62,307,813 96	88,470,624 95	38,323,237 10	4,873,369 96	12,712,745 84	15,842,390 81	45,694,907 66											
Machinery, locomotives, and cars.....	1,945,533 51	1,243,531 03		590,434 80	3,180,250 91													
Real estate other than road.....	611,285 74				2,555,341 95	42,834 65	4,154,785 84											
Fuel, materials, and supplies.....	111,086 49	1,864,636 13	144,786 83	64,747 91	80,041 20	106,298 77	242,312 56											
Cash.....	3,532 72	401,824 58	141,646 95	39,632 46	286,201 72	1,290,428 17	709,978 95											
Company's bonds and stocks other bonds and stocks and investments in other corporations.....	425,000 00		2,866,971 37		249,629 33	88,523 60												
Bills receivable.....	30,000 00	1,760 28	3,105 35	5,000 40	12,215 26		1,949 21											
Accounts receivable.....	586,152 76	705,288 57	120,491 52	216,545 46	110,832 70	215,342 21	170,488 81											
Due from United States.....	3,100 14			4,938 68	11,679 19	54,775 32												
Sinking funds in hands of trustees.....							651,731 80											
Deficit.....	916,729 73			6,073,934 85	4,086,433 26		2,577,753 79											
Total.....	66,843,245 07	98,844,731 42	41,600,239 12	11,868,602 52	23,285,371 46	18,157,542 83	54,219,959 41											

* No statement.

TABLE No. 7.—*Liabilities and assets*—Continued.

	Dubuque and Sioux City Railroad Company.*	Winona and Saint Peter Railroad Company.	Southern Minnesota Railway Company.*	Saint Paul and Duinith Railroad Company.*	Chicago, Saint Paul and Minneapolis Rail-road Company.	Chicago, Milwaukee and Saint Paul Railway Company.	Wisconsin Central Railroad Company.*	Vicksburg, Shreveport and Pacific Railroad Company.*
		June 30, 1890				Dec. 31, 1879	June 30, 1890	
LIABILITIES.								
Bonded debt.....		\$4,844,000 00				\$5,038,000 00	\$47,575,500 00	
Interest due and accrued.....						235,110 00	18,596 92	
Pay-rolls and vouchers.....						84,468 98		
Bills payable.....						47,732 74	105,776 08	
Accounts payable.....		1,557,322 35				83,723 09	1,372,071 64	
Capital stock.....		400,000 00				5,000,000 00	27,663,744 00	
Surplus.....						162,437 87	3,435,441 83	
Total.....		10,801,322 35				10,651,432 38	80,281,130 47	
ASSETS.								
Cost of road and fixtures.....		10,692,720 93				9,845,243 63	73,836,637 28	
Fuel, materials, and supplies.....						94,283 05	813,969 91	
Cash.....						70,772 12	1,288,970 45	
Company's bonds and stocks.....						77,287 23		
Other bonds and stocks and investments in other corporations.....						1328,646 91	3,603,815 22	
Bills receivable.....						33,578 53	13,495 56	
Accounts receivable.....						3,665 91	724,222 02	
Due from United States.....		47,000 00						
Sinking funds in hands of trustees.....		61,601 42						
Deficit.....								
Total.....		10,801,322 35				10,651,432 38	80,281,130 47	

* No statement.

† Includes land contracts.

TABLE No. 8

	No. of miles from which revenue is derived.	Year ending—	United States.		
			Passenger	Mail.	Freight.
Union Pacific.....	1, 035. 20	7 mos. ending Jan. 31, 1880	\$108,163 76	\$348, 118 75	\$254,442 83
Kansas Pacific.....	672	do	\$15, 733 10	50, 796 78	
Denver Pacific Railway and Telegraph.....	106	do	\$231 00	532 65	\$1, 468 77
Union Pacific Railway (consolidated).....	8, 036. 848	5 mos. ending June 30, 1880	104, 158 00	304, 883 61	174, 098 52
			228, 285 86	704, 331 79	430, 010 12
Central Pacific.....	2, 456. 43	June 30, 1880		488, 610 32	
Central Branch Union Pacific.....	361	do		16, 567 01	
Sioux City and Pacific.....	217. 41	do	4, 277 30	15, 458 81	2, 076 71
Burlington and Missouri River in Nebraska.....	815. 1	Dec. 31, 1879			
Texas and Pacific.....	483. 86	June 30, 1880		41, 622 36	
Southern Pacific.....	726. 96	do		11, 865 76	
Northern Pacific.....	781. 1	do	19, 953 93	41, 328 91	21, 258 27
Saint Louis and San Francisco.....	629	do		37, 539 33	
Oregon and California.....	197. 36	do		19, 746 72	
Hannibal and Saint Joseph.....	292. 35	Dec. 31, 1879		48, 463 26	
Missouri Pacific.....	294. 58	do		112, 844 31	
Saint Louis, Iron Mountain and Southern.....	709. 5	do		106, 529 28	
Little Rock and Fort Smith.....	165. 16	June 30, 1880		9, 959 28	
Memphis and Little Rock.....	133	do		6, 196 86	
Missouri, Kansas and Texas.....	793. 5	do		116, 221 12	
Atchison, Topeka and Santa Fe.....	1, 393. 8	do	62, 064 37	132, 929 12	134, 154 64
Kansas City, Lawrence and Southern.....	306. 74	Dec. 31, 1879		13, 831 45	
Saint Joseph and Western.....	251	7 mos. ending Apr. 30, 1880		8, 563 15	
Chicago, Burlington and Quincy.....	1, 857. 3	Dec. 31, 1879		\$562, 440 66	
Chicago, Rock Island and Pacific.....	1, 811	Mar. 31, 1880		198, 519 03	
Cedar Rapids and Missouri River.....	274. 01	June 30, 1880		60, 508 46	
Dubuque and Sioux City.....	142. 89	do		13, 663 00	
Iowa Falls and Sioux City.....	183. 69	do		17, 054 88	
Winona and Saint Peter.....	319. 96	do		25, 241 53	
Southern Minnesota (no statement).....					
Saint Paul and Duluth.....	175	June 30, 1880		7, 382 14	
Saint Paul, Minneapolis and Manitoba (no statement).....					
Chicago, Milwaukee and Saint Paul.....	3, 000. 3	June 30, 1880		246, 789 08	
Wisconsin Central.....	455. 73	Dec. 31, 1879		24, 263 30	
Chicago, Saint Paul and Minneapolis.....	201. 4	do		13, 074 91	
Vicksburg, Shreveport and Pacific.....	98	6 mos. ending June 30, 1880		3, 819 58	

a 6 months.

* Including sleeping-car.

† Including steamer.

‡ Six months, 1879

—Revenue.

Passenger earnings.	Express.	Freight earnings.	Rents.	Miscellaneous.	Total earnings.	Income other than earnings.	Total revenue.
\$1,758,891 80	\$182,110 36	\$5,534,825 35	.....	\$94,008 67	\$8,280,561 32	\$753,011 16	\$9,033,572 48
674,936 61	85,808 86	2,300,625 01	.....	18,533 61	3,146,433 97	26,552 83	3,172,986 80
36,145 19	2,260 08	71,979 40	.....	2,186 74	114,804 43	.....	114,804 43
2,475,030 57	292,122 11	5,470,835 21	.....	154,879 08	8,976,007 10	1,111,070 35	10,087,077 45
4,945,003 97	562,302 01	13,378,264 97	.....	269,608 10	20,517,806 82	1,890,634 34	22,408,441 16
3,235,573 62	216,540 98	11,169,085 87	.....	698,637 37	17,802,448 16	929,126 08	18,731,574 24
208,806 26	9,350 00	754,757 75	.....	28,863 37	1,017,864 39	102,530 70	1,120,415 09
125,915 87	4,581 31	390,437 02	.....	6,901 01	549,048 03	18,947 94	568,595 97
477,193 57	.....	1,648,680 73	.....	77,081 67	2,182,915 97	.....	2,182,915 97
466,736 78	22,456 45	2,075,993 44	.....	16,457 74	2,623,266 77	2,386,035 39	5,009,302 16
399,349 34	12,250 56	455,382 51	\$1,632,554 93	23,478 31	2,534,881 41	457,751 19	2,992,632 60
504,230 62	40,303 85	1,547,353 12	.....	4,625 08	2,230,577 37	4,408,747 12	6,639,324 49
322,408 22	31,735 48	1,858,815 06	.....	5,339 55	2,255,858 54	1,964 73	2,257,823 27
192,183 75	12,000 00	247,009 63	.....	31,692 34	505,632 44	.....	505,632 44
566,876 06	30,349 91	1,247,835 29	.....	103,681 14	1,997,406 66	209,539 80	2,206,946 46
1,000,080 10	82,372 81	2,624,524 19	.....	103,071 95	3,922,893 36	226,264 02	4,149,157 38
992,002 68	65,309 25	4,103,664 78	8,690 63	116,414 67	5,292,611 27	99,820 00	5,392,431 27
136,331 56	9,501 82	271,099 05	.....	6,858 49	433,550 20	.....	433,550 20
177,795 68	8,612 01	242,023 26	.....	6,855 00	433,482 81	.....	433,482 81
779,864 32	56,120 00	3,098,948 11	.....	31,049 37	4,062,322 92	116,205 30	4,188,528 22
1,537,535 21	68,629 32	5,421,893 64	.....	32,640 79	7,469,847 09	534,041 05	7,933,888 14
120,394 28	18,000 00	329,343 84	.....	13,628 58	485,238 15	145,376 13	641,614 28
70,580 62	.....	334,709 73	.....	3,674 39	417,527 89	.....	417,527 89
2,566,652 19	.....	11,650,622 56	.....	.....	14,779,715 41	37,390 31	14,817,105 72
2,318,452 20	122,562 75	8,035,165 29	.....	386,963 19	11,061,662 46	350,000 00	11,411,662 46
620,804 70	40,332 61	2,187,021 28	.....	3,576 18	2,912,238 21	.....	2,912,238 21
238,432 97	14,518 57	749,179 96	.....	3,620 30	1,009,414 20	.....	1,009,414 20
138,804 12	4,662 90	320,794 77	.....	16,876 30	498,192 97	.....	498,192 97
308,730 21	7,846 51	686,319 24	.....	18,885 06	1,047,022 55	216,015 47	1,263,638 02
996,420 50	3,833 69	481,992 38	.....	113,815 24	603,443 95	.....	603,443 95
2,755,067 94	230,159 15	7,616,997 75	.....	81,266 53	10,930,290 45	243,600 27	11,173,893 72
212,191 83	8,475 40	596,544 12	.....	9,616 24	851,090 69	.....	851,090 69
300,300 08	19,334 34	838,442 21	.....	2,849 74	1,174,001 28	.....	1,174,001 28
23,734 39	745 41	41,273 11	.....	120 00	69,692 49	.....	69,692 49

§ Including express and miscellaneous.

|| Including government transportation.

TABLE No. 9.—

Names of railroad companies.	Number of miles from which revenue is derived.	Year ending—	Expenses of transportation.	Maintenance of way.	Maintenance of rolling-stock.
Union Pacific	1, 035. 20	7 mos. ending Jan. 31, 1880	\$1, 758, 585 42	\$711, 232 25	\$250, 649 02
Kansas Pacific	672	do	707, 672 27	731, 007 94	101, 620 96
Denver Pacific Railway and Telegraph	106	do	49, 887 57	45, 876 37	3, 433 21
Union Pacific Railway (consolidated) ..	3, 036. 848	5 mos. ending June 30, 1880	2, 094, 723 43	1, 515, 286 42	310, 117 17
			4, 610, 868 69	3, 003, 402 98	671, 820 36
Central Pacific	2, 456. 43	June 30, 1880	4, 440, 193 59	1, 934, 054 40	1, 047, 884 94
Central Branch Union Pacific	361	do	292, 257 71	348, 609 72	35, 572 01
Sioux City and Pacific	217. 41	do	158, 919 00	127, 876 89	18, 749 81
Burlington and Missouri River in Nebraska (no statement)	815. 1	June 30, 1880	738, 730 61	487, 917 06	104, 700 46
Texas and Pacific	483. 86	do	330, 977 91	134, 449 72	59, 970 10
Southern Pacific	726. 96	do	586, 132 35	509, 993 93	78, 628 45
Northern Pacific	781. 1	do	508, 244 09	377, 831 96	58, 938 40
Saint Louis and San Francisco	629	do	154, 297 21	96, 142 08	17, 554 17
Oregon and California	197. 36	do	523, 457 29	262, 518 22	181, 693 52
Hannibal and Saint Joseph	292. 35	Dec. 31, 1879	1, 087, 301 02	488, 368 61	352, 750 05
Missouri Pacific	294. 58	do	1, 656, 370 26	684, 896 15	360, 168 00
St. Louis, Iron Mountain and Southern	709. 5	do	140, 538 16	48, 122 78	22, 151 08
Little Rock and Fort Smith	165. 16	June 30, 1880	140, 701 09	78, 699 91	21, 124 85
Memphis and Little Rock	133	do	1, 020, 692 84	423, 166 25	214, 310 21
Missouri, Kansas and Texas	793. 5	do	1, 626, 965 10	940, 026 67	298, 011 35
Atchison, Topeka and Santa Fé	1, 393. 8	do	83, 317 12	163, 499 82	43, 085 97
Kansas City, Lawrence and Southern	306. 74	Dec. 31, 1879			
Saint Joseph and Western	251	7 mos. ending Apr. 30, 1880			
Chicago, Burlington and Quincy	1, 857. 3	Dec. 31, 1879	3, 192, 174 33	1, 752, 279 73	1, 436, 289 06
Chicago, Rock Island and Pacific	1, 311	Mar. 31, 1880	2, 893, 931 76	1, 596, 858 08	824, 605 34
Cedar Rapids and Missouri River (no statement for fiscal year)	274. 01	June 30, 1880			
Dubuque and Sioux City	142. 89	do	153, 349 85	143, 050 30	59, 778 22
Iowa Falls and Sioux City	183. 69	do	107, 043 26	57, 689 09	44, 933 87
Winona and Saint Peter	319. 96	do	496, 919 12	508, 703 84	107, 652 02
Southern Minnesota (no statement)					
Saint Paul and Duluth	175	June 30, 1880	193, 698 77	221, 380 15	72, 131 16
Saint Paul, Minneapolis and Manitoba (no statement)					
Chicago, Milwaukee and Saint Paul	3, 000. 3	June 30, 1880	2, 806, 555 41	1, 616, 858 44	888, 791 54
Wisconsin Central	455. 73	Dec. 31, 1879	211, 383 74	163, 127 82	60, 818 26
Chicago, Saint Paul and Minneapolis	201. 4	do	370, 026 66	167, 272 04	55, 158 85
Vicksburg, Shreveport and Pacific	73	6 mos. ending June 30, 1880	23, 778 86	28, 438 36	3, 669 26

Expenditures.

General ex- penses and taxes.	Total operating expenses.	Rentals of leased lines.	Interest paid on bonds, debt, premium on gold, &c.	Miscellaneous payments.	Dividends paid.	Total income ex- penditures.	Total expendi- tures.
\$321,562 45	\$3,048,029 14		\$1,729,596 92	\$344,313 79	\$1,102,350 00	\$3,176,260 71	\$6,224,289 85
301,270 21	1,841,571 88		27,175 80	353,073 14		380,249 03	2,221,820 41
20,753 56	119,950 71						119,950 71
392,373 13	4,312,500 15		1,431,028 37	991,496 28	1,366,784 50	3,609,299 15	8,121,799 80
1,035,059 55	9,322,051 38		3,187,801 18	1,688,873 21	2,489,134 50	7,365,908 89	16,687,860 27
1,186,829 90	8,608,962 92	\$3,009,867 63	3,781,825 96	1,326,375 91	1,628,965 00	9,746,334 50	18,355,267 42
67,844 78	744,384 22	196,924 15	70,050 00	199,897 39		466,871 54	1,211,255 76
86,738 86	392,264 56	28,947 47	98,120 15		11,830 00	138,897 62	531,182 18
211,551 31	1,542,899 44		662,520 00	2,713,025 91		3,375,545 91	4,914,445 35
231,286 15	756,683 88		1,872,480 39	148,058 61		2,020,539 00	2,777,222 88
213,022 18	1,409,154 75	197,165 91	160,274 03	646,208 96		4,003,648 90	5,372,197 85
44,152 35	987,166 80		654,289 23	22,647 12		676,886 35	1,664,053 15
115,585 70	383,579 16						383,579 16
255,762 94	1,223,421 97		657,320 00	275,582 01		932,902 01	2,156,323 98
210,739 47	2,139,159 15	145,694 12	994,110 00	202,535 59		1,342,339 71	8,481,498 86
299,621 66	2,992,056 07		2,362,454 36	379,258 71		2,741,713 07	5,733,769 14
	210,813 02						210,813 02
38,341 86	278,867 71						278,867 71
294,829 42	1,923,996 72			573,833 54		573,833 54	2,497,832 26
515,220 32	3,330,223 44	637,820 12	1,510,858 44	701,295 61	691,311 00	2,541,285 17	5,921,508 61
75,755 96	365,658 87		86,200 00	138,680 25		227,080 25	592,739 12
	348,101 98						348,101 98
1,176,323 51	7,557,067 23		2,110,937 65	1,832,670 93	3,081,985 17	4,245,593 75	14,582,660 98
479,170 93	5,796,566 11	272,537 37	940,610 00	1,128,672 12	2,097,990 00	4,439,809 49	10,236,375 60
69,191 23	425,369 60						425,369 60
88,839 05	298,505 27						298,505 27
38,778 25	1,152,053 23		603,782 51	291,900 52		895,683 03	2,047,686 26
46,201 09	533,391 17	20,000 00		77,285 81		97,285 81	630,676 98
988,346 20	6,298,551 59		2,522,047 48	70,000 00	1,783,819 36	4,375,866 84	10,674,418 43
61,808 93	497,138 75	160,861 65		50,995 83		211,857 48	708,996 23
78,376 13	670,833 68	43,806 04	300,796 65	341,945 96		686,650 67	1,357,884 35
6,297 99	62,184 47						62,184 47

* Includes \$21,377.84 Pacific division.

† Six months, 1879.



TABLE No. 10.—*Operations*

Name of railroad company.	Date of original land grant act.	Date of amendatory land grant act.	Number of miles covered by grants.	Number of sections per mile granted.	Estimated number of acres granted.
Union Pacific (main line)	July 1, 1862	July 2, 1864	1,038.68	20	12,000,000
Kansas Division (late Kansas Pacific)	July 1, 1862	July 2, 1864	638.6	20	6,000,000
Denver Division (late Denver Pacific)	July 1, 1862	Mar. 3, 1869	106	20	1,100,000
Central Branch Union Pacific	July 1, 1862	July 2, 1864	100	20	215,166
Central Pacific (east from Sacramento)	July 1, 1862	July 2, 1864	737.5	20	7,997,600
Western Pacific	July 1, 1862	July 2, 1864	123.16	20	1,100,000
Oregon Branch	July 25, 1866	.....	291	20	3,724,800
Sioux City and Pacific*	July 1, 1862	July 2, 1864	101.77	10	41,318.23
Northern Pacific	July 2, 1864	May 31, 1870	2,317	{ 20 } 40	42,000,000
Southern Pacific	July 27, 1866	Mar. 3, 1871	934.70	20	11,964,160
Missouri Pacific	June 10, 1852	.....	37	6	1,161,235.67
Saint Louis and San Francisco	June 10, 1852	.....	203	6	.....
Atlantic and Pacific	July 27, 1866	.....	1,755.70	{ 20 } 40	49,244,803.26
Burlington and Missouri River	July 2, 1864	.....	190.5	20	2,441,600
Cedar Rapids and Missouri River †	May 15, 1856	June 2, 1864	271.6	6	1,298,730
Hannibal and Saint Joseph	June 10, 1852	.....	206.41	6	781,944.83
Saint Joseph and Western	July 23, 1866	.....	227	20	1,700,000
Oregon and California	July 25, 1866	.....	200	20	3,840,000
Oregon Central	May 4, 1870	.....	47.5	10	100,000
Saint Louis, Iron Mountain and South'n	Feb. 9, 1853	{ July 4, 1866 } July 28, 1866	514	10	4,106,647.30
Memphis and Little Rock	Feb. 9, 1853	July 28, 1866	133	10	804,185.80
Little Rock and Fort Smith	Feb. 9, 1853	July 28, 1866	165.16	10	1,009,296.34
Missouri, Kansas and Texas	Mar. 3, 1863	{ July 1, 1864 } July 26, 1866	183.2	10	1,520,000
Kansas City, Lawrence and Southern	Mar. 3, 1863	.....	143.22	10	800,000
Cedar Rapids, Topeka and Santa Fe	Mar. 3, 1863	.....	470.58	10	3,003,870
Chicago, Burlington and Quincy	May 15, 1856	June 2, 1864	279	6	948,643
Chicago, Rock Island and Pacific	May 15, 1856	June 2, 1864	317	6	1,261,181
Chicago, Milwaukee and Saint Paul	Mar. 3, 1857	{ May 12, 1864 } July 4, 1866	335	10	2,727,403
Southern Minnesota	July 4, 1866	.....	167.05	10	735,000
Chicago, Saint Paul, Minneapolis and } Omaha	June 3, 1856	May 5, 1864	177.5	10	999,983.38
Saint Paul and Sioux City	Mar. 3, 1857	May 12, 1864	121.27	10	1,199,849.67
Sioux City and Saint Paul	May 12, 1864	.....	122.35	10	551,148.57
North Wisconsin	June 3, 1856	May 5, 1864	42.5	10	1,408,452.69
Iowa Falls and Sioux City	May 15, 1856	June 2, 1864	183.69	6	1,226,163.05
Dubuque and Sioux City	May 15, 1856	June 2, 1864	142.89	6	.....
Wisconsin Central	May 5, 1864	.....	256.37	10	1,800,000
Winona and Saint Peter	Mar. 3, 1857	Mar. 3, 1865	323.22	10	1,832,989
Saint Paul, Minneapolis and Manitoba	Mar. 3, 1857	{ July 12, 1862 } Mar. 3, 1865	387	10	4,723,638.95
Saint Paul and Duluth	May 5, 1864	July 13, 1866	156	10	920,000
Stillwater and Saint Paul	Mar. 3, 1857	Mar. 3, 1865	13	10	.....
Saint Paul, Stillwater and Taylor Falls	Mar. 3, 1857	.....	18	10	.....
Vicksburg, Shreveport and Pacific	June 3, 1856	{ Forfeited by } act of July	93	6	610,880
Morgan's Louisiana and Texas	June 3, 1856	15, 1870.	80	6	967,840
			14,351.12	.....	179,922,528.54

* All lands, lots, and land assets of this road were sold April 13, 1875, to the Missouri Valley Land Company for \$200,000.

† In States.

‡ In Territories.

§ All land sold for \$300,000 to the Iowa Railroad Land Company on September 13, 1899.

of land departments.

Number of acres patented to June 30, 1880.	Total sales of land.				Estimated quantity of acres of granted land remaining unsold.	Estimated value of unsold lands.
	Date.	Acres.	Amount.	Average per acre.		
1,839,474 59	Dec. 31, 1879	1,568,438.62	\$7,432,534.98	\$4.73	10,431,561.38	\$10,431,561.38
828,830 44	June 30, 1880	1,439,953.32	4,266,589.32	2.98	4,566,046.64	10,415,116.70
49,811 59	June 30, 1880	164,604.78	732,067.71	4.45	935,995.22	2,238,487.05
187,907 99	Mar. 31, 1877	70,287.53	227,425.41	4.66	174,784.70	1,748,784.70
708,862 17						
424,727 58	June 30, 1880	728,534.54	4,324,888.70	5.95	10,995,865.46	10,995,865.46
1,338,039 27						
41,318 23	Apr. 15, 1875	41,318.23	200,000.00	5.00		
746,509 52	June 30, 1880	2,593,983.18	9,089,453.99	3.50	39,406,016.82	97,515,042.46
1,048,090 65	June 30, 1880	279,623.40	1,999,396.06	4.28	11,684,536.60	11,684,536.60
1,161,204 51	Dec. 31, 1879	553,873.95	1,461,855.73	2.63	607,361.12	3,036,805.60
504,536 60	Dec. 31, 1879	220,250.20	623,369.04	2.86	49,024,544.06	24,512,272.06
2,374,090 77	Jan. 1, 1879	11,041,525.74	6,836,329.11	7.93	1,400,074.26	14,000,742.60
1,140,493 53					1,208,730	6,493,650.00
603,506 31	Dec. 31, 1879	512,998.74	4,802,448.89	9.55	268,946.09	2,689,460.80
461,813 24					1,700,000	8,506,000.00
323,148 68	Dec. 31, 1879	82,072.55	175,650.37	2.14	3,757,827.45	9,394,818.62
None					100,000	125,000.00
1,286,363 66	June 30, 1880	264,802.35	1,129,873.99	4.27	3,841,844.95	9,604,612.37
141,844 70					804,185.80	2,010,464.50
916,716 44					1,009,296.34	2,523,240.85
658,068 13	June 30, 1880	435,554.07	1,604,014.97	3.68	1,084,445.93	5,422,226.65
256,281 66	June 30, 1880	199,759.58	597,166.88	2.98	600,240.42	3,001,202.10
2,474,326 47	June 30, 1880	993,675.79	5,802,965.98	5.84	2,012,194.21	3,030,485.52
388,817 35	June 30, 1880	284,014.52	3,430,572.05	12.12	665,828.48	6,656,294.80
643,307 17	Apr. 1, 1880	371,854	2,944,374.00	7.91	889,327	7,114,516.00
654,141 17	Dec. 31, 1878	148,857			2,580,546	12,902,730.00
454,936 86					735,000	3,665,000.00
802,816 80	Dec. 31, 1879	252,752.73	307,654.68	4.19	669,855.84	3,349,279.20
1,200,358 01	June 30, 1880	77,374.81			875,905.37	4,378,528.85
296,998 89	June 30, 1880	324,543.70	2,099,387.87	6.49	318,021.22	1,593,106.10
843,497 56		232,127.36	1,506,135.66	6.48	1,408,452.69	7,042,262.45
683,023 80	June 30, 1880	314,275.41	2,088,994.25	6.85	361,419.68	1,807,098.40
550,467 96					550,467.96	2,702,239.80
575,844 56	Dec. 31, 1879	76,734.80	400,204.99	5.60	1,723,265.80	8,616,329.40
1,668,007 90	June 30, 1880	**557,574.98	1,045,801.58	3.98	1,295,414.02	6,477,070.10
2,031,337 89	Dec. 31, 1877	458,865	3,651,641.00	7.94	4,264,773.95	21,323,869.75
860,564 09	June 30, 1880	28,964	106,462.00	3.67	891,035.11	2,227,587.77
65,113 64	June 30, 1880	12,862.01	60,386.34	4.69	52,251.63	156,754.89
44,246 47	June 30, 1880	9,028.73	47,813.06	5.30	35,217.74	105,653.22
353,211 70					610,880	
279,332 85					967,840	
32,131,731 52		14,310,204.16	68,905,479.31		164,512,334.38	322,899,130.85

*Sales made during years 1874, 1875, 1876, and 1877, not being reported, are not included in this amount.

* The West Wisconsin Railroad Company, of which this organization is the successor, had disposed of 232,752.73 acres before the property came into the hands of the new company.

** Of this quantity 317,061.26 acres were conveyed for purchase of the first 103 miles of road.

TABLE No. 10.—Operations of land departments—Continued.

Name of railroad company.	Lands sold during year—			
	Ending—	Acres.	Average price per acre.	Amount.
Union Pacific (main line)	Dec. 31, 1879	243,337.31	\$4 15	\$1,007,855 63
Kansas Division (late Kansas Pacific)	June 30, 1880	150,534.46	3 86	581,726 53
Denver Division (late Denver Pacific)	June 30, 1880	8,834.74	4 89	43,267 32
Central Branch Union Pacific				
Central Pacific (east from Sacramento)				
Western Pacific	June 30, 1880	91,269.63	3 54	322,775 49
Oregon Branch				
Sioux City and Pacific*				
Northern Pacific	June 30, 1880	304,276.58	2 67	812,521 04
Southern Pacific	June 30, 1880	11,697.36	4 00	46,789 44
Missouri Pacific				
Saint Louis and San Francisco	Dec. 31, 1879	40,343.98		
Atlantic and Pacific	Dec. 31, 1879	2,462.88	2 81	6,934 17
Burlington and Missouri River	Dec. 31, 1878	514,098	5 15	2,650,511 00
Cedar Rapids and Missouri River †				
Hannibal and Saint Joseph	Dec. 31, 1879	64,272.59	7 76	494,773 06
Saint Joseph and Western				
Oregon and California	Dec. 31, 1879	9,927.50	2 50	25,658 10
Oregon Central				
Saint Louis, Iron Mountain and Southern	Dec. 31, 1879	47,088.15	3 67	172,623 96
Memphis and Little Rock	Dec. 31, 1878	3,033.97	2 02	6,047 40
Little Rock and Fort Smith				
Missouri, Kansas and Texas	June 30, 1880	48,422.89	2 40	116,206 92
Kansas City, Lawrence and Southern	Half-year ending June 30, 1880.	20,215.71	3 23	66,419 36
Atchison, Topeka and Santa Fé	June 30, 1880	80,982	5 31	430,358 70
Chicago, Burlington and Quincy	Dec. 31, 1879	26,139.53	14 05	363,997 59
Chicago, Rock Island and Pacific	Apr. 1, 1880	93,318.36	8 63	803,970 40
Chicago, Milwaukee and Saint Paul	Dec. 31, 1878	7,634	4 17	31,833 78
Southern Minnesota	Dec. 31, 1878	4,252.05	6 79	28,872 32
Chicago, Saint Paul, Minneapolis and Omaha	Dec. 31, 1879	25,098.45	4 28	107,421 37
Saint Paul and Sioux City	18 mos. ending June 30, 1880.	30,955.44	6 64	205,564 99
Sioux City and Saint Paul	18 mos. ending June 30, 1880.	33,672.35	6 30	212,365 90
North Wisconsin				
Iowa Falls and Sioux City	June 30, 1880	26,279	4 65	122,197 35
Dubuque and Sioux City		36,296		
Wisconsin Central	Dec. 31, 1879	10,525.57	2 44	27,103 35
Winona and Saint Peter	June 30, 1880	103,139.75	3 20	330,047 20
Saint Paul, Minneapolis and Manitoba	Dec. 31, 1877	89,327	4 13	368,920 51
Saint Paul and Duluth	18 mos. ending June 30, 1880.	11,230.87	2 67	29,888 81
Stillwater and Saint Paul				
Saint Paul, Stillwater and Taylor Falls	18 mos. ending June 30, 1880.	3,080	2 24	6,896 00
Vicksburg, Shreveport and Pacific				
Morgan's Louisiana and Texas				
		2,141,716.12		\$9,442,747 68

* All lands, lots, and land assets of this road were sold April 15, 1875, to the Missouri Valley Land Company for \$200,000.

† All lands sold for \$800,000 to the Iowa Railroad Land Company on September 15, 1880.

RAILROAD ACCOUNTS.

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TABLE No. 11.

COMPARATIVE STATEMENTS OF EARNINGS AND EXPENSES.

Statement of the earnings and expenses of the Union Pacific Railway (consolidated) for five months ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$2,579,188 57	\$1,866,784 77	Conducting transportation	\$806,845 85	\$632,315 19
Freight	5,644,933 73	4,161,547 73	Motive power	1,405,598 62	1,058,590 90
Mail	304,883 61	285,282 23	Maintenance of cars	312,692 68	276,324 63
Express	292,123 11	194,064 44	Maintenance of way	1,440,872 08	1,063,363 02
Miscellaneous	154,879 06	263,867 91	General expenses and taxes	347,990 92	281,225 15
Total	8,976,007 10	6,771,547 08	Total	4,312,500 15	3,411,796 79
Miles of road operated..	1,814,848	1,814,848	Net earnings	4,663,506 95	3,359,838 29

Statement of the earnings and expenses of the Union Pacific Railroad for seven months ending January 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$1,867,055 36	\$1,784,041 62	Conducting transportation	\$620,587 01	\$565,321 45
Freight	5,789,268 18	5,397,806 79	Motive power	1,232,376 03	1,067,992 04
Mail	348,118 75	348,118 75	Maintenance of cars	256,649 02	237,413 73
Express	182,110 26	291,244 75	Maintenance of way	624,054 63	805,396 67
Miscellaneous	94,008 67	93,846 57	General expenses and taxes	314,262 45	304,265 60
Total	8,280,561 32	7,917,058 48	Total	3,048,029 14	2,980,489 39
Miles of road operated..	1,035,20	1,035,20	Net earnings	5,232,532 18	4,936,569 09

Statement of the earnings and expenses of the Kansas Pacific Railway for seven months ending January 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$690,669 71	\$478,562 77	Conducting transportation	\$363,999 52	\$296,770 85
Freight	2,300,625 01	1,774,353 41	Motive power	431,843 14	365,522 59
Mail	50,796 26	52,886 92	Maintenance of cars	101,836 42	99,780 79
Express	85,808 86	75,320 07	Maintenance of way	705,644 08	423,477 94
Miscellaneous	18,533 61	16,099 20	General expenses and taxes	238,248 22	274,688 53
Total	3,146,433 97	2,397,242 37	Total	1,841,571 38	1,465,190 19
Miles of road operated..	672	672	Net earnings	1,304,862 59	932,052 18

Statement of the earnings and expenses of the Denver Pacific Railway for seven months ending January 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$36,376 19	\$28,287 62	Conducting transportation	\$28,166 32	\$14,701 94
Freight	73,448 17	42,348 60	Motive power	25,691 36	16,345 00
Mail	532 65	8,514 45	Maintenance of cars	3,433 21	1,896 39
Express	2,260 68	1,997 82	Maintenance of way	44,614 51	11,203 32
Miscellaneous	2,186 74	2,033 50	General expenses and taxes	18,045 31	19,005 39
Total	114,904 43	73,181 99	Total	119,950 71	63,152 04
Miles of road operated..	106	106	Deficit	5,146 28	
			Net earnings		10,029 95

Statement of the earnings and expenses of the Union Pacific Railway (as consolidated) for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$5, 173, 289 83	\$4, 159, 696 74	Conducting transportation.....	\$1, 818, 098 70	\$1, 509, 108 93
Freight.....	13, 808, 275 09	11, 376, 056 53	Motive power.....	3, 085, 509 15	2, 508, 440 53
Mail.....	704, 331 79	694, 802 35	Maintenance of cars.....	674, 611 33	615, 265 44
Express.....	562, 302 01	562, 627 08	Maintenance of way.....	2, 815, 185 30	2, 308, 440 95
Miscellaneous.....	269, 608 10	375, 847 18	General expenses and taxes.....	918, 646 90	979, 284 56
Total.....	20, 517, 806 82	17, 169, 029 88	Total.....	9, 322, 051 38	7, 920, 540 41
Miles of road operated..	1, 814. 848	1, 814. 848	Net earnings.....	11, 195, 755 44	9, 248, 489 47

Statement of the earnings and expenses of the Union Pacific Railroad for the calendar years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger.....	\$3, 207, 909 92	\$3, 190, 369 72	Conducting transportation.....	\$1, 004, 507 89	\$965, 921 11
Freight.....	8, 682, 414 24	8, 500, 955 76	Motive power.....	2, 004, 334 18	1, 709, 039 02
Mail.....	596, 775 00	598, 775 00	Maintenance of cars.....	447, 012 81	447, 531 58
Express.....	360, 840 90	491, 145 79	Maintenance of way.....	1, 397, 696 78	1, 548, 950 38
Miscellaneous.....	343, 137 60	342, 026 31	General expenses and taxes.....	621, 951 80	705, 144 10
Total.....	13, 201, 077 66	13, 121, 272 58	Total.....	5, 475, 503 44	5, 376, 586 19
Miles of road operated..	1, 035. 20	1, 035. 20	Net earnings.....	7, 725, 574 22	7, 744, 686 39

Statement of the earnings and expenses of the Kansas Pacific Railway for years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger.....	\$1, 136, 466 31	\$782, 806 03	Conducting transportation.....	\$548, 352 35	\$524, 459 93
Freight.....	3, 273, 908 56	2, 594, 189 55	Motive power.....	665, 727 42	621, 604 87
Mail.....	85, 288 65	85, 343 62	Maintenance of cars.....	182, 634 24	145, 436 73
Express.....	131, 218 93	117, 610 81	Maintenance of way.....	1, 073, 861 86	709, 649 56
Miscellaneous.....	36, 423 93	30, 274 27	General expenses and taxes.....	261, 495 27	406, 867 86
Total.....	4, 663, 301 38	3, 610, 224 28	Total.....	2, 731, 571 14	2, 407, 418 96
Miles of road operated..	672	672	Net earnings.....	1, 931, 730 24	1, 202, 806 33

Statement of the earnings and expenses of the Denver Pacific Railway for the calendar years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger.....	\$62, 421 11	\$44, 998 10	Conducting transportation.....	\$35, 453 89	\$29, 236 73
Freight.....	101, 072 46	80, 986 54	Motive power.....	35, 993 95	28, 349 72
Mail.....	3, 649 05	14, 596 20	Maintenance of cars.....	3, 807 73	2, 968 17
Express.....	4, 163 45	3, 936 85	Maintenance of way.....	46, 614 19	23, 224 11
Miscellaneous.....	4, 580 97	2, 505 03	General expenses and taxes.....	21, 139 44	24, 985 11
Total.....	175, 787 04	147, 022 22	Total.....	143, 009 20	108, 573 84
Miles of road operated..	106	106	Net earnings.....	32, 777 84	38, 448 38

Statement of the earnings and expenses of the Central Pacific Railroad for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$4,266,257 89	\$3,660,300 82	Conducting transportation	\$1,583,838 42	\$1,568,826 74
Freight	8,949,842 31	7,904,055 84	Motive power	1,846,379 44	1,587,552 24
Mail	396,982 18	312,609 87	Maintenance of cars	474,917 86	574,607 11
Express	168,010 29	153,332 86	Maintenance of way	1,797,097 16	1,410,795 01
Miscellaneous	502,103 12	489,880 11	General expenses and taxes*	3,475,621 63	3,019,518 02
Total	14,283,195 79	12,520,129 50	Total	9,177,954 51	8,161,299 12
Miles of road operated ..	2,448.89	2,303.12	Net earnings	5,105,241 28	4,358,830 38

Statement of the earnings and expenses of the Central Pacific Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$5,235,573 62	\$5,185,802 52	Conducting transportation	\$2,057,529 34	\$2,127,621 88
Freight	11,169,085 87	10,979,804 75	Motive power	2,224,286 80	2,199,496 67
Mail	458,610 32	507,039 58	Maintenance of cars	673,449 82	723,912 63
Express	210,540 96	221,711 42	Maintenance of way	2,012,277 33	2,035,981 34
Miscellaneous	698,637 37	717,322 63	General expenses and taxes†	4,608,941 63	4,222,894 34
Total	17,802,448 16	17,611,680 90	Total	11,586,484 92	11,309,908 86
Miles of road operated ..	2,389.93	2,210.67	Net earnings	6,215,963 24	6,301,772 04

Statement of the earnings and expenses of the Central Pacific Railroad for years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger	\$4,919,254 63	\$5,284,918 07	Conducting transportation	\$2,088,288 28	\$2,012,479 69
Freight	10,934,573 39	10,802,276 40	Motive power	2,165,419 40	2,140,901 69
Mail	417,847 23	438,799 51	Maintenance of cars	740,124 43	707,361 08
Express	208,500 79	235,795 76	Maintenance of way	1,855,569 25	2,108,487 49
Miscellaneous	678,487 12	769,073 81	General expenses and taxes†	4,276,897 74	2,989,440 44
Total	17,153,163 16	17,580,858 55	Total	11,126,299 10	9,958,650 39
Miles of road operated ..	2,325.2506	2,121.619	Net earnings	6,026,864 06	7,572,208 16

Statement of the earnings and expenses of the Central Branch Union Pacific Railroad for eight months ending August 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$152,992 89	\$109,224 52	Conducting transportation	\$49,043 35	\$84,000 10
Freight	395,463 89	460,255 18	Motive power	119,596 86	100,325 26
Mail	12,716 29	6,745 28	Maintenance of cars	29,336 16	21,476 82
Express	6,360 00	5,235 00	Maintenance of way	143,040 60	102,606 85
Miscellaneous	10,069 70	15,958 19	General expenses and taxes	20,576 81	39,865 48
Total	577,702 77	597,418 17	Total	311,660 41	348,274 01
Miles of road operated, estimated	330	230	Net earnings	266,042 36	249,144 16

*Includes rentals, 1880, \$2,540,011.79; 1879, \$2,035,118.07.

†Includes rentals, 1880, \$3,009,867.63; 1879, \$2,563,303.52.

‡Includes rentals, 1879, \$2,690,323.15; 1878, \$2,509,720.65.

Statement of the earnings and expenses of the Sioux City and Pacific Railroad for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$84, 772 92	\$66, 233 25	Conducting transportation	\$46, 257 70	\$23, 676 45
Freight	272, 195 05	187, 704 18	Motive power	50, 111 28	86, 753 12
Mail	7, 668 16	6, 651 69	Maintenance of cars	11, 810 73	12, 183 00
Express	3, 461 12	2, 556 99	Maintenance of way	128, 874 53	102, 062 87
Miscellaneous	3, 631 77	6, 469 95	General expenses and taxes	17, 809 82	19, 962 76
Total	371, 729 02	269, 616 06	Total	254, 864 06	194, 626 50
Miles of road operated..	107.42	107.42	Net earnings	116, 864 96	74, 987 47

Statement of the earnings and expenses of the Sioux City and Pacific Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$105, 783 08	\$87, 329 61	Conducting transportation	\$46, 105 02	\$31, 118 99
Freight	328, 276 89	248, 046 21	Motive power	58, 467 92	48, 638 60
Mail	10, 189 93	8, 255 88	Maintenance of cars	19, 704 65	16, 800 51
Express	8, 940 50	3, 012 01	Maintenance of way	155, 272 24	123, 999 84
Miscellaneous	7, 235 88	6, 685 55	General expenses and taxes	17, 793 27	23, 651 10
Total	455, 426 23	353, 329 26	Total	297, 343 10	254, 209 13
Miles of road operated..	107.42	107.42	Net earnings	158, 083 13	99, 120 13

Statement of the earnings and expenses of the Sioux City and Pacific Railroad for years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger	\$63, 142 12	\$85, 098 66	Conducting transportation	\$33, 690 05	\$38, 971 19
Freight	285, 689 71	247, 572 22	Motive power	52, 220 89	49, 687 17
Mail	9, 207 46	8, 473 14	Maintenance of cars	19, 806 50	15, 577 68
Express	3, 479 71	2, 565 02	Maintenance of way	138, 408 00	132, 358 84
Miscellaneous	8, 411 27	6, 214 27	General expenses and taxes	22, 471 82	25, 696 41
Total	399, 930 27	349, 923 31	Total	266, 597 26	261, 293 29
Miles of road operated..	107.42	107.42	Net earnings	133, 333 01	88, 630 02

Statement of the earnings and expenses of the Texas and Pacific Railway for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$466, 736 78	\$448, 502 49	Conducting transportation	\$422, 381 80	\$414, 164 33
Freight	2, 075, 993 44	1, 587, 584 02	Motive power	316, 348 81	307, 271 18
Mail	41, 622 36	59, 790 10	Maintenance of cars	104, 700 46	83, 396 34
Express	22, 456 45	20, 010 58	Maintenance of way	487, 917 06	539, 994 03
Miscellaneous	16, 457 74	16, 796 65	General expenses and taxes	211, 551 31	42, 785 17
Total	2, 623, 266 77	2, 132, 683 84	Total	1, 542, 899 44	1, 387, 613 04
Miles of road operated..	483.86	443.86	Net earnings	1, 080, 367 33	745, 070 80

Statement of the earnings and expenses of the Southern Pacific Railroad for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$321, 672 99	\$321, 019 90	Conducting transportation	\$166, 887 71	\$144, 937 58
Freight	349, 747 25	305, 424 06	Motive power	114, 242 99	108, 781 87
Mail	9, 271 78	8, 541 18	Maintenance of cars	80, 847 75	36, 833 43
Express	9, 321 14	10, 330 73	Maintenance of way	96, 630 68	122, 950 28
Miscellaneous	1, 255, 628 90	1, 260, 071 78	General expenses and taxes	176, 112 51	218, 125 13
Total	1, 945, 642 06	1, 905, 387 65	Total	571, 774 11	631, 628 20
Miles of road operated..	721.83	711.56	Net earnings	1, 373, 867 95	1, 273, 759 36

Statement of the earnings and expenses of the Southern Pacific Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$399, 349 34	\$455, 007 50	Conducting transportation	\$207, 218 61	\$200, 337 45
Freight	455, 382 51	478, 754 19	Motive power	143, 598 72	157, 712 23
Mail	11, 865 76	11, 888 24	Maintenance of cars	40, 130 68	46, 565 59
Express	12, 250 56	15, 850 77	Maintenance of way	134, 449 72	208, 074 65
Miscellaneous	1, 656, 083 24	1, 697, 131 22	General expenses and taxes	231, 286 15	286, 496 65
Total	2, 534, 881 41	2, 658, 131 91	Total	756, 683 88	899, 185 56
Miles of road operated..	715.41	711.56	Net earnings	1, 778, 197 53	1, 758, 946 35

Statement of the earnings and expenses of the Southern Pacific Railroad for the calendar years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger	\$411, 361 14	\$477, 924 94	Conducting transportation	\$194, 606 27	\$195, 326 98
Freight	427, 992 06	471, 262 72	Motive power	142, 917 86	159, 158 03
Mail	11, 388 24	10, 175 19	Maintenance of cars	47, 756 25	39, 720 59
Express	13, 320 88	17, 515 79	Maintenance of way	155, 019 11	218, 050 34
Miscellaneous	1, 680, 819 76	1, 693, 607 94	General expenses and taxes	245, 090 69	319, 441 99
Total	2, 524, 882 06	2, 670, 486 58	Total	785, 889 18	931, 697 98
Miles of road operated..	711.75	711.75	Net earnings	1, 739, 492 88	1, 738, 788 65

Statement of the earnings and expenses of the Northern Pacific Railroad for eight months ending August 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$380, 334 57	\$301, 694 11	Conducting transportation	\$244, 978 45	\$155, 618 96
Freight	938, 843 91	771, 057 89	Motive power	244, 188 27	171, 487 11
Mail	34, 690 65	23, 902 22	Maintenance of cars	60, 475 42	37, 630 21
Express	42, 987 29	9, 790 50	Maintenance of way	322, 194 04	258, 342 33
Miscellaneous	2, 542 60	6, 658 01	General expenses and taxes	145, 591 76	186, 578 47
Total	1, 399, 398 99	1, 113, 102 73	Total	1, 017, 427 94	759, 657 06
Miles of road operated..	721	691.7	Net earnings	381, 971 05	354, 045 65

Statement of the earnings and expenses of the Northern Pacific Railroad for fiscal year ending June 30, 1880.

Earnings.	1880.	18—.	Expenses.	1880.	18—.
Passenger	\$549, 473 27		Conducting transportation	\$314, 064 02	
Freight	1, 568, 819 42		Motive power	342, 680 51	
Mail	45, 641 71		Maintenance of cars	79, 883 26	
Express	40, 539 84		Maintenance of way	483, 454 12	
Miscellaneous	6, 103 68		General expenses and taxes	189, 072 84	
Total	2, 230, 577 37		Total	1, 409, 154 75	
Miles of road operated ..	721		Net earnings	831, 422 62	

Statement of the earnings and expenses of the Saint Louis and San Francisco Railway for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$297, 420 80	\$148, 574 45	Conducting transportation	\$221, 478 79	\$136, 264 86
Freight	1, 496, 386 57	838, 878 76	Motive power	203, 187 82	121, 429 67
Mail	31, 968 85	22, 430 20	Maintenance of cars	53, 884 56	54, 473 04
Express	28, 213 77	16, 283 94	Maintenance of way	405, 944 12	145, 370 75
Miscellaneous	3, 257 22	5, 650 22	General expenses and taxes	41, 565 09	37, 453 35
Total	1, 857, 337 21	1, 032, 019 57	Total	926, 060 38	495, 091 47
Miles of road operated ..	559. 94	361. 80	Net earnings	931, 276 83	536, 928 10

Statement of the earnings and expenses of the Saint Louis and San Francisco Railway for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$323, 396 57	\$181, 797 94	Conducting transportation	\$266, 782 55	\$148, 154 57
Freight	1, 860, 795 11	939, 647 02	Motive power	241, 785 96	148, 155 55
Mail	38, 029 60	27, 711 72	Maintenance of cars	75, 963 71	45, 246 62
Express	82, 314 07	25, 826 51	Maintenance of way	346, 990 67	221, 496 93
Miscellaneous	5, 329 13	8, 363 77	General expenses and taxes	57, 207 99	44, 468 63
Total	2, 259, 564 57	1, 183, 346 96	Total	1, 006, 700 88	607, 612 19
Miles of road operated ..	510. 08	330. 33	Net earnings	1, 252, 863 69	575, 734 77

Statement of the earnings and expenses of the Oregon and California Railroad for ten months ending October 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$174, 069 95	\$172, 096 34	Conducting transportation	\$85, 540 27	\$111, 998 89
Freight	179, 832 03	190, 762 23	Motive power	33, 238 93	25, 238 48
Mail	16, 809 04	18, 776 27	Maintenance of cars	14, 200 50	77, 008 52
Express	10, 150 00	10, 000 00	Maintenance of way	99, 520 90	89, 292 61
Miscellaneous	24, 358 52	25, 424 19	General expenses and taxes	89, 292 61	96, 608 08
Total	405, 219 54	415, 059 03	Total	321, 793 21	308, 853 92
Miles of road operated ..	209. 7	200	Net earnings	88, 426 33	105, 205 11

Statement of the earnings and expenses of the Western Oregon Railroad for nine months ending September 30, 1880.

Earnings.	1880.	18—	Expenses.	1880.	18—
Passenger.....	\$34,165 15		Conducting transportation.....	\$28,528 80	
Freight.....	42,406 98		Motive power.....	13,561 08	
Mail.....	2,779 58		Maintenance of cars.....	5,116 52	
Express.....	2,226 79		Maintenance of way.....	85,063 60	
Miscellaneous.....	2,270 75		General expenses and taxes.....	21,514 31	
Total.....	82,849 25		Total.....	103,783 76	
Miles of road operated..	97		Deficit.....	20,934 51	

Statement of the earnings and expenses of the Saint Louis, Iron Mountain and Southern Railway for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$853,408 60	\$663,143 37	Conducting transportation.....	\$917,934 81	\$719,001 13
Freight.....	3,204,330 02	2,445,222 09	Motive power.....	646,477 84	477,184 54
Mail.....	81,036 39	78,765 77	Maintenance of cars.....	267,248 65	192,791 04
Express.....	74,451 10	47,947 77	Maintenance of way.....	926,000 74	586,141 02
Miscellaneous.....	45,008 91	20,574 02	General expenses and taxes.....	141,517 75	195,923 58
Total.....	4,288,229 02	3,255,653 02	Total.....	2,890,179 89	2,151,041 30
Miles of road operated..	684½	684½	Net earnings.....	1,398,049 13	1,104,611 72

Statement of the earnings and expenses of the Saint Louis, Iron Mountain and Southern Railway for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$1,008,313 71	\$643,315 23	Conducting transportation.....	\$1,220,189 88	\$945,119 51
Freight.....	4,650,885 49	3,432,379 81	Motive power.....	817,364 76	622,230 74
Mail.....	108,041 12	104,898 44	Maintenance of cars.....	294,847 75	220,862 12
Express.....	66,936 14	62,335 69	Maintenance of way.....	866,272 84	701,248 43
Miscellaneous.....	48,826 13	30,778 31	General expenses and taxes.....	212,519 20	318,387 44
Total.....	5,982,002 59	4,574,196 48	Total.....	3,411,144 43	2,807,838 23
Miles of road operated..	694½	684½	Net earnings.....	2,570,858 16	1,766,358 25

Statement of the earnings and expenses of the Little Rock and Fort Smith Railway for six months ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$75,348 78	\$50,069 25	Conducting transportation.....	\$44,699 46	\$34,642 73
Freight.....	102,939 16	59,684 35	Motive power.....	24,859 62	31,971 24
Mail.....	4,979 64	4,979 64	Maintenance of cars.....	12,642 35	7,530 90
Express.....	4,341 95	1,965 70	Maintenance of way.....	31,590 35	25,074 13
Miscellaneous.....	2,989 41	2,509 65	General expenses and taxes.....		
Total.....	190,598 94	119,208 59	Total.....	113,800 78	108,319 05
Miles of road operated..	165	165	Net earnings.....	76,798 16	10,889 54

Statement of the earnings and expenses of the Little Rock and Fort Smith Railway for fiscal years ending June 30, 1889 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$136,331 56	\$98,541 84	Conducting transportation.....	\$89,217 98	\$69,973 39
Freight.....	271,099 05	160,597 21	Motive power.....	51,320 18	50,684 11
Mail.....	9,959 28	9,388 86	Maintenance of cars.....	22,151 08	14,715 09
Express.....	9,501 83	4,312 67	Maintenance of way.....	48,123 78	57,373 71
Miscellaneous.....	6,658 49	5,333 70	General expenses and taxes.....		
Total.....	433,550 20	278,774 28	Total.....	210,813 02	192,746 81
Miles of road operated..	165	165	Net earnings.....	222,737 18	86,027 47

Statement of the earnings and expenses of the Missouri, Kansas and Texas Railway for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$591,918 06	\$502,537 69	Conducting transportation.....	\$414,448 50	\$346,896 54
Freight.....	2,261,034 13	1,559,941 65	Motive power.....	625,897 47	357,554 12
Mail.....	88,963 16	82,098 80	Maintenance of cars.....	204,201 43	151,098 39
Express.....	45,000 00	46,950 00	Maintenance of way.....	289,653 89	287,775 53
Miscellaneous.....	89,409 39	3,044 94	General expenses and taxes.....	102,768 41	112,877 29
Total.....	3,025,774 74	2,188,568 08	Total.....	1,436,968 69	1,256,781 68
Miles of road operated..	786	786	Net earnings.....	1,588,806 05	931,786 40

Statement of the earnings and expenses of the Missouri, Kansas and Texas Railway for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$779,984 32	\$712,067 68	Conducting transportation.....	\$533,526 01	\$482,932 52
Freight.....	3,098,948 71	2,087,629 32	Motive power.....	554,142 32	506,850 05
Mail.....	116,221 12	119,458 38	Maintenance of cars.....	258,753 97	216,377 16
Express.....	56,120 00	54,775 00	Maintenance of way.....	394,963 71	421,137 61
Miscellaneous.....	31,048 77	3,804 68	General expenses and taxes.....	182,712 71	222,062 15
Total.....	4,082,323 92	2,978,735 06	Total.....	1,923,996 72	1,849,369 09
Miles of road operated..	786	786	Net earnings.....	2,158,324 20	1,129,365 97

Statement of the earnings and expenses of the Atchison, Topeka and Santa Fe Railroad for eight months ending August 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$1,159,222 48	\$948,343 94	Conducting transportation.....	\$539,129 49	\$444,073 12
Freight.....	3,737,883 48	2,798,287 33	Motive power.....	624,850 32	474,680 06
Mail.....	114,064 40	54,970 56	Maintenance of cars.....	241,099 00	128,423 47
Express.....	52,569 49	84,400 00	Maintenance of way.....	714,121 58	684,479 99
Miscellaneous.....	3,490 85	3,237 73	General expenses and taxes.....	70,333 15	81,864 86
Total.....	5,067,180 70	3,789,239 56	Total.....	2,189,633 55	1,808,521 50
Miles of road operated..	1,307½	920½	Net earnings.....	2,877,547 15	1,980,718 06

Statement of the earnings and expenses of the Atchison, Topeka and Santa Fé Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$1,599,599 58	\$1,162,241 36	Conducting transportation.....	\$854,744 88	\$624,743 61
Freight.....	5,554,048 28	3,894,986 18	Motive power.....	849,652 89	661,133 14
Mail.....	132,929 12	63,080 00	Maintenance of cars.....	293,940 89	194,295 07
Express.....	68,629 52	49,073 90	Maintenance of way.....	949,572 04	864,768 56
Miscellaneous.....	5,584 36	5,927 20	General expenses and taxes.....	255,576 29	287,850 39
Total.....	7,362,790 66	5,195,308 64	Total.....	3,194,486 49	2,544,785 77
Miles of road operated..	1,190.33	852.33	Net earnings.....	4,168,304 17	2,650,522 87

Statement of the earnings and expenses of the Chicago, Rock Island and Pacific Railroad for seven months ending July 31, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$1,390,579 27	\$1,138,680 88	Conducting transportation.....	\$1,590,238 78	\$1,373,645 69
Freight.....	4,984,189 84	3,929,905 63	Motive power.....	211,984 17	175,223 60
Mail.....	110,199 81	90,763 23	Maintenance of cars.....	472,865 13	323,008 60
Express.....	71,426 20	70,980 00	Maintenance of way.....	1,198,824 55	1,042,996 19
Miscellaneous.....	219,470 47	241,943 31	General expenses and taxes.....	498,735 74	406,879 75
Total.....	6,775,865 59	5,372,271 05	Total.....	3,973,648 37	3,321,747 33
Miles of road operated..	1,308	1,231	Net earnings.....	2,803,217 23	2,050,523 23

Statement of the earnings and expenses of the Chicago, Rock Island and Pacific Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$3,579,537 58	\$1,943,113 41	Conducting transportation.....	\$2,612,458 48	\$2,226,461 98
Freight.....	8,371,101 94	7,121,528 62	Motive power.....	343,655 13	287,036 83
Mail.....	296,849 43	152,500 58	Maintenance of cars.....	716,288 25	523,125 41
Express.....	122,562 75	118,910 00	Maintenance of way.....	1,816,212 06	1,750,967 14
Miscellaneous.....	381,654 60	353,394 24	General expenses and taxes.....	664,585 70	537,083 83
Total.....	11,461,706 30	9,789,376 85	Total.....	6,153,200 47	5,324,675 18
Miles of road operated..	1,273.75	1,175.083	Net earnings.....	5,308,505 83	4,464,701 67

Statement of the earnings and expenses of the Iowa Falls and Sioux City Railroad for nine months ending September 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger.....	\$117,747 92	\$97,125 53	Conducting transportation.....	\$81,943 12	\$76,928 40
Freight.....	249,131 33	219,734 57	Motive power.....		
Mail.....	12,791 18	11,762 93	Maintenance of cars.....		
Express.....	8,489 75	3,474 90	Maintenance of way.....		
Miscellaneous.....	12,537 10	12,680 70	General expenses and taxes.....		
Total.....	\$35,697 28	\$44,778 63	Total.....	339,360 65	217,856 15
Miles of road operated..	183.69	196.69	Net earnings.....	156,327 63	129,923 48

Statement of the earnings and expenses of the Iowa Falls and Sioux City Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$138,804 12	\$137,340 65	Conducting transportation	\$107,043 26	\$109,684 77
Freight	320,794 77	307,483 48	Motive power		
Mail	17,054 88	14,938 90	Maintenance of cars		
Express	4,662 90	4,643 05	Maintenance of way		
Miscellaneous	16,876 30	15,917 98	General expenses and taxes		
Total	496,192 97	480,326 06	Total	298,505 27	294,636 30
Miles of road operated..	183.69	183.69	Net earnings	199,687 70	185,689 76

Statement of the earnings and expenses of the Winona and Saint Peter Railroad for nine months ending September, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$255,202 25	\$195,668 82	Conducting transportation	\$170,782 91	\$182,763 79
Freight	558,103 57	402,067 05	Motive power		
Mail	17,558 34	14,758 67	Maintenance of cars		
Express	9,654 70	5,546 37	Maintenance of way		
Miscellaneous	17,129 50	8,921 64	General expenses and taxes		
Total	854,658 36	626,956 55	Total	996,255 73	764,898 95
Miles of road operated..	502½	406.10	Deficit	141,597 37	137,942 40

Statement of the earnings and expenses of the Winona and Saint Peter Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	From Jan. to June, 1880.	From Jan. to June, 1879.
Passenger	\$308,730 21	\$260,005 46	Conducting transportation	\$111,095 75	\$147,678 69
Freight	688,319 34	512,453 96	Motive power		
Mail	25,241 33	12,817 87	Maintenance of cars		
Express	7,846 51	7,295 91	Maintenance of way		
Miscellaneous	18,885 06	10,869 25	General expenses and taxes		
Total	1,047,022 55	803,442 45	Total	613,298 27	495,328 97
			From July to December, 1879 and 1878	538,754 96	406,964 25
			Total	1,152,053 23	901,812 22
Miles of road operated..	456.04	385.82	Deficit	105,090 68	158,370 77

Statement of the earnings and expenses of the Saint Paul and Duluth Railroad for nine months ending September, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$84,178 00	\$71,292 36	Conducting transportation	\$137,914 56	\$139,290 73
Freight	322,184 23	314,753 21	Motive power		
Mail	5,536 60	7,605 11	Maintenance of cars		
Express	3,028 24	2,329 93	Maintenance of way		
Miscellaneous	21,485 64	3,008 34	General expenses and taxes		
Total	436,412 71	398,986 95	Total	368,794 53	294,207 43
Miles of road operated..	171.22	169	Net earnings	67,618 18	104,691 53

Statement of the earnings and expenses of the Saint Paul and Duluth Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$96,420 50	\$79,921 19	Conducting transportation	\$187,921 00	\$159,644 05
Freight	481,992 33	372,183 67	Motive power	84,938 93	60,843 98
Mail	7,832 14	10,140 18	Maintenance of cars	194,559 81	110,374 04
Express	8,448 06	3,358 01	Maintenance of way		
Miscellaneous	18,992 54	3,813 19	General expenses and taxes	23,097 78	24,840 86
Total	603,235 57	469,416 24	Total	495,517 52	355,702 93
Miles of road operated	169	169	Net earnings	107,718 05	113,718 31

Statement of the earnings and expenses of the Chicago, Milwaukee and Saint Paul Railway for six months ending June, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$1,396,993 76	\$915,626 82	Conducting transportation	\$752,152 02	\$396,836 01
Freight	3,477,588 61	2,711,296 29	Motive power	805,600 11	131,036 62
Mail	122,730 26	83,053 04	Maintenance of cars	299,219 48	199,003 58
Express	111,903 40	81,561 70	Maintenance of way	864,701 66	616,342 73
Miscellaneous	71,068 56	55,735 50	General expenses and taxes	611,011 59	1,104,273 78
Total	5,180,234 59	3,852,273 85	Total	3,332,684 86	2,437,492 63
Miles of road operated	2,580½	1,772	Net earnings	1,847,549 73	1,414,780 78

Statement of the earnings and expenses of the Chicago, Milwaukee and Saint Paul Railway for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$2,755,067 94	\$2,012,005 77	Conducting transportation	\$1,250,009 78	\$769,156 00
Freight	7,616,997 75	5,465,406 84	Motive power	962,501 91	261,012 89
Mail	246,798 08	172,303 21	Maintenance of cars	571,801 26	421,904 47
Express	214,153 71	170,581 83	Maintenance of way	1,616,858 44	1,155,084 87
Miscellaneous	163,273 16	134,785 80	General expenses and taxes	1,907,380 20	2,197,148 61
Total	10,996,281 64	7,956,083 55	Total	6,298,551 59	4,804,306 84
Miles of road operated	2,404.91	1,709.33	Net earnings	4,697,730 05	3,151,777 21

Statement of the earnings and expenses of the Vicksburg, Shreveport and Pacific Railroad for fiscal years ending June 30, 1880 and 1879.

Earnings.	1880.	1879.	Expenses.	1880.	1879.
Passenger	\$46,107 76	\$30,917 11	Conducting transportation	\$38,120 81	\$29,497 43
Freight	146,444 28	77,410 31	Motive power	15,967 57	15,404 08
Mail	5,591 04	3,522 45	Maintenance of cars	12,158 08	4,975 55
Express	1,749 65	860 86	Maintenance of way	53,716 91	49,533 43
Miscellaneous	270 00	797 53	General expenses and taxes	16,158 95	13,894 74
Total	200,162 73	113,508 26	Total	136,119 32	113,805 17
Miles of road operated	73	73	Net earnings	64,043 41	203 09

Statement of the earnings and expenses of the Vicksburg, Shreveport and Pacific Railroad for calendar years 1879 and 1878.

Earnings.	1879.	1878.	Expenses.	1879.	1878.
Passenger.....	\$41,533 79	\$33,159 79	Conducting transportation		
Freight	136,247 80	76,451 92	Motive power	\$87,027 32	\$26,987 75
Mail	4,174 71	2,700 86	Maintenance of cars ..	17,634 40	15,532 68
Express	1,547 62	783 42	Maintenance of way ...	10,249 35	5,088 35
Miscellaneous	822 55	374 94	General expenses and taxes	54,409 35	47,198 35
				17,135 99	13,804 25
Total.....	184,326 47	113,476 93	Total.....	136,456 41	108,701 56
Miles of road operated..	73	73	Net earnings	47,672 06	4,776 37

ANNUAL REPORT

OF THE

UNITED STATES GEOLOGICAL SURVEY.

UNITED STATES GEOLOGICAL SURVEY,
OFFICE OF THE DIRECTOR,
November 1, 1880.

Hon. CARL SCHURZ,
Secretary of the Interior, Washington, D. C. :

SIR: I have the honor to present herewith the first annual report of the United States Geological Survey, covering the fiscal year ending June 30, 1880.

Congress having prescribed the mode of publishing the results of the survey, it is intended to confine these pages to a simple statement of the bureau organization, progress of field investigation, and results already attained.

The law creating the office of Director of the Geological Survey was enacted and approved March 3, 1879. On March 21, 1879, the President nominated me first Director of the Geological Survey, the Senate confirmed his action on April 3, 1879, and on May 24 I took the prescribed oath of office, and entered on my duties.

Congress expressed its determination to inaugurate the Geological Survey in a provision of law so brief, that I give it entire, in order to comprise in this report the history of the origin and organization of this bureau.

GEOLOGICAL SURVEY.

For the salary of the Director of the Geological Survey, which office is hereby established under the Interior Department, who shall be appointed by the President, by and with the advice and consent of the Senate, six thousand dollars: *Provided*, That this officer shall have the direction of the Geological Survey, and the classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain. And that the Director and members of the Geological Survey shall have no personal or private interests in the lands or mineral wealth of the region under survey, and shall execute no surveys or examinations for private parties or corporations; and the Geological and Geographical Survey of the Territories, and the Geographical and Geological Survey of the Rocky Mountain Region, under the Department of the Interior, and the Geographical Surveys west of the one hundredth meridian, under the War Department, are hereby discontinued, to take effect on the thirtieth day of June, eighteen hundred and seventy-nine. And all collections of rocks, minerals, soils, fossils, and objects of natural history, archaeology, and ethnology, made by the Coast and Interior Survey, the Geological Survey, or by any other parties for the Government of the United States, when no longer needed for investigations in progress, shall be deposited in the National Museum.

For the expenses of the Geological Survey, and the classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain, to be expended under the direction of the Secretary of the Interior, one hundred thousand dollars. Enacted and approved March 3, 1879.

Prior to the above enactment, and at irregular intervals since the early years of this century, the national government had made various attempts

to acquire and diffuse information on the geological structure and mineral resources of the United States. Geologists were dispatched to report upon certain fields of mineral industry, and to nearly every military exploration or international boundary survey was attached some one more or less competent to delineate and describe the geological features of the land traversed. Instances of success in this line of expeditionary geological reconnaissance may be found in the reports of the Pacific Railroad and Colorado River surveys, executed under the Corps of Engineers of the Army, and those of the Mexican boundary surveys; while in the department of economical geology, Forster and Whitney's Lake Superior report stands almost alone.

Up to 1867, geology was made to act as a sort of camp-follower to expeditions whose main object was topographical reconnaissance. Charged with definite objects and missions, the leaders of these corps have tolerated geology rather as a hinderance than a benefit. In consequence, such subsidiary geological work amounts to little more than a slight sketch of the character and distribution of formations, valuable chiefly as indicating the field for future inquiry.

In the year 1867, however, Congress ordered the geological exploration of the fortieth parallel, a labor designed to render geological maps of the country about to be opened up by the Union and Central Pacific Railroads, then in process of construction. In this work, geology was the sole object. For the first time a government geologist found himself in independent command, able to direct the movements and guide the researches of a corps of competent professional assistants. At the same session of Congress, Dr. Hayden's "Geological and Geographical Survey of the Territories" was ordered, and a little later Maj. J. W. Powell's "Geological and Geographical Survey of the Rocky Mountain Region" was likewise placed in the field.

Eighteen hundred and sixty-seven, therefore, marks, in the history of national geological work, a turning point, when the science ceased to be dragged in the dust of rapid exploration and took a commanding position in the professional work of the country.

Congress, even then, hardly more than placed the Federal work on a par with that prosecuted by several of the wealthier States. During the years when the Federal geologists were following the hurried and often painful marches of the Western explorers, many States inaugurated and brought to successful issue State surveys whose results are of dignity and value.

Since 1867 the government work has been equal to the best State work, and in some important branches has taken the lead. The wisdom of the legislation which placed in the field those well-organized, well-equipped, and ably-manned corps is apparent in the improved and enlarged results obtained.

But there remained one more step necessary to give the highest efficiency and most harmonious balance to the national geological work. It was the discontinuance of the several geological surveys under personal leadership, and the foundation of a permanent bureau charged with the investigation and elucidation of the geological structure and mineral resources and productions of the United States.

The legislation above cited, and upon which the existence of this bureau is based, leaves some room for doubt as to the precise intention of Congress, both regarding the functions of the organization and its field. Two special and distinct branches of duty are imposed upon the Director of the Geological Survey. 1. The classification of the public land; and, 2. The examination of the geological structure and mineral resources.

As regards the classification of public lands, the text of the law leaves an uncertainty whether this classification is intended to be a scientific exposition of the kinds of lands embraced in the national domain, such as arable, irrigable, timber, desert, mineral, coal, iron, showing the practical values and adaptabilities of the various classes or kinds of soil and surface, or whether, on the other hand, it was intended to furnish a basis of classification, upon which the government should part title to portions of the public domain.

At present the General Land Office possesses the machinery for the survey, classification, and sale of the public lands. In that bureau the field-notes and maps of the various deputy surveyors are intended to convey sufficiently accurate information for the general guidance of the officers who execute the sales. The law also provides a method of proof as to the character of lands, which forms an indispensable stage in the process of sale. Any transaction as to a piece of public lands may be challenged before the proper officers, and its character may be determined by competent proof. The present method of sale of the public lands depends, therefore, chiefly upon a rule of law rather than the classification of experts in advance of the procedure of sale.

Upon examination of the existing land system, I have assumed that Congress, in directing me to make a classification of the public lands, could not have intended to supersede the machinery of the Land Office, and substitute a classification to be executed by another bureau of government, without having distinctly provided for the necessary changes within the Land Office, and adjustment of relations between the two bureaus.

The Public Lands Commission, created by Congress in the same law which organized the Geological Survey, carefully examined into the question of classification and disposition of the public lands. In the deliberate opinion of that body, it has been adjudged impracticable for the Geological Survey, or any other branch of the Interior Department, to execute a classification in advance of sale, without seriously impeding the rapid settlement of the unoccupied lands.

I have therefore concluded that the intention of Congress was to begin a rigid scientific classification of the lands of the national domain, not for purposes of aiding the machinery of the General Land Office, by furnishing a basis of sale, but for the general information of the people of the country, and to produce a series of land maps which should show all those features upon which intelligent agriculturists, miners, engineers, and timbermen might hereafter base their operations, and which would obviously be of the highest value for all students of the political economy and resources of the United States. Studies of this sort, entirely aside from the administration of the Land Office, can be made of the highest practical value; and to this end a careful beginning has been made.

A second ambiguity in the language of the law which I am called upon to execute, will be found in the use of the term "national domain." All operations of this bureau are, by the language of the law, intended to cover the "national domain."

That term was supposed by the first framers of the law to cover the entire United States. On the other hand, it might be held to mean simply the region of the public lands. It was of the utmost importance, before beginning to plan for any field operations, to know whether "national domain" meant the lands owned by the nation, or the area within its outer boundaries.

With the small appropriation given to begin the vast work of this bu-

reau, I considered it best to confine the operations to the region of the public land, concerning which field there could be no question as to my legal authority. In the case, therefore, of the uncertainties arising from the language of the law, I have chosen to take the conservative side, and have neither invaded the functions of the General Land Office, nor placed my field parties outside the area of the public lands.

Former national geological surveys have been conducted by means of annual campaigns in the far West. The corps, when driven from the field by the snows of late autumn, have returned to Washington, there to await the accidents of appropriation; and, if provided for by Congress, to take the field at the close of Congressional sessions.

By this means a large amount of valuable time has been lost in breaking up the Western camps and removing the corps to Washington and again returning to the field the following year. Moreover, a very large item of transportation cost has been annually incurred.

GEOGRAPHICAL FIELD DIVISIONS.

I have entirely abandoned that plan, and have divided the region west of the 101st meridian into four geological districts. It will be seen by the map accompanying this report that these districts do not always coincide with political lines. On the contrary, they are outlined to embrace certain definite geological fields.

In passing westward the first division is that of the Rocky Mountains, which starts from the Mexican boundary on the Rio Grande, near its intersection with the 107th meridian. From that point the line follows the Texan boundary east to the 103d meridian, which it traces northward to the parallel of 37, and thence making a short jog eastward of a degree and a half of longitude, coincides with the eastern boundary of Colorado to the 41st parallel, and then continues along the meridian of the 102d to latitude 45. From that point a due west line is drawn to the 104th meridian, thence north along that line to the British boundary. The northern boundary of the district coincides with the British boundary to the meridian 116. From that point it follows the boundary line between Idaho and Montana southeasterly to its junction with the 111th meridian, and from that point south to the 41st parallel, thence east to the 109th meridian, and thence south to the Mexican boundary.

Embraced within these boundaries lie Colorado, New Mexico, Wyoming, and Montana, and a small part of Dakota; an area inclosing the whole great chain of the Rocky Mountains, whose geographical function is the dividing of the watershed of the Atlantic from that of the Pacific. This chain is made up of a great number of ranges and groups of mountains separated from each other by deep depressions, in which are either passes or inclosed lowlands known as parks. From the Mexican to the British boundary, the system is a geological unit, and should be studied as one, without reference to political lines.

One division of the survey corps, trained in any one part of this system, would have an immense advantage in deciphering the geological history of any other part. The same system of coal-fields, the same types of economical mineral deposits—gold, silver, and iron ore-bodies—extend from one end to the other of this vast mountain district. In charge of this field I have placed Mr. S. F. Emmons, geologist-in-charge, whose main office is fixed at Denver, Colo.

The Division of the Colorado embraces a remarkable plateau and cañon country unparalleled elsewhere in the world, which lies between the Rocky Mountains and the Great Basin. It is, in the main, a country

drained by the great cañons of the Colorado River, and consists of elevated plateaus, above which arise isolated groups of mountains, and through which is traced a wonderful labyrinth of cañons from three to six thousand feet in depth.

This division has been for twelve or thirteen years the field of exploration of Maj. J. W. Powell, who has expended here over \$300,000 in explorations and surveys, which are of the highest scientific value, and of which only the beginning has been published. His extensive work is inherited by the present bureau, and the Division of the Colorado is intended only as a temporary one until this work, already far advanced, can be brought to completion. The main portion of the division is most easily reached from Salt Lake City, and the headquarters of the division has been placed there in charge of Capt. C. E. Dutton, United States Ordnance Corps, geologist in-charge.

The Division of the Great Basin is also a characteristic tract of country, differing essentially from the Rocky Mountains and the Colorado Plateau, which bound it on the east, and the country of the Sierra Nevada, Cascade, and Pacific coast ranges, which lie between it and the ocean on the west. It is for the most part a series of desert plains, interrupted by more or less parallel mountain chains. The chief peculiarity of three-quarters of the area is that its drainage never reaches the sea. Its geological characteristics, equally with its geographical ones, separate it from the surrounding country. It is a region to be studied by itself, and is of the highest importance from its abundant silver districts. Mr. G. K. Gilbert, geologist-in-charge, has been assigned to the direction of this division, with headquarters placed, for convenience of access, at Salt Lake; and it is designed that one office and one field laboratory will meet the requirements of this and the Colorado Division.

The Division of the Pacific embraces the whole of Washington Territory, that part of Oregon which lies west of the Blue Mountains, and all of California, except the desert region lying east of the Sierra Nevada and south of the thirty-eighth parallel, which, from its geological and physical characteristics, belongs, not to the series of Pacific coast mountains, but to the arid region of the Great Basin. The headquarters of the Pacific Division is placed at San Francisco; Mr. Arnold Hague, geologist in charge.

As soon as the work upon the cañons and plateaus of the Colorado is done it is intended to discontinue that division and to divide it on the line of the Colorado River between the Divisions of the Rocky Mountains and that of the Great Basin. Thus, after the space of four or five years, there will remain but three divisions west of the 102d meridian. The location and boundary of these divisions are clearly shown upon the map accompanying this report.

The Appropriation Committee of the House of Representatives were informed by me of the uncertainties as to the meaning of the term "national domain"; and they immediately caused to be offered House Resolution No. 116, extending the field of the geological survey over the whole United States. That resolution was promptly passed in the House, but is still pending in the Senate; but, in advance of the action of the Senate, I have laid down on the accompanying map the four divisions into which I would propose to district that part of the United States east of the 102d meridian.

Of the great Appalachian system of mountains, extending from New Brunswick to Alabama, I have made two divisions—one embracing Maryland, Delaware, Pennsylvania, New Jersey, New York, and the

New England States; the other embracing West Virginia, Virginia, North and South Carolina, Georgia, Florida, Alabama, Tennessee, and Kentucky.

These two areas will include the whole Appalachian mountain system in two parts of about equal geological importance; and, with the four divisions west of the 102d meridian, cover all the mountain country of the United States.

There remains, then, only the basin of the Mississippi, which, with all its enormous extent, is really one field and one geological problem. From its great size, however, I have thought best to divide it, as the lines upon the map will show, into two grand divisions; first, the Division of the North Mississippi, bounded west of the Mississippi on the south by a line including Missouri and Kansas, to the intersection of the 39th parallel with the 102d meridian. East of the Mississippi River the Ohio forms the dividing line between the Northern and Southern districts.

By placing each division under the charge of a geologist, whose personal experience and acquirements fit him to undertake the investigation of the chief problems of that division, and assigning to him a competent corps of assistants, a far better result will be obtained than by any plan of expeditionary operations, with parties moving from division to division. It is intended, on the contrary, to strictly confine each corps to its own division, and to keep it permanently at work there, except in case of certain technical economical investigations. In this respect the organization resembles that of the Army and the Coast and Geodetic Survey.

I have so arranged the initial work of the survey that special volumes on the most important geological subjects and mining industries in the four western divisions of the survey shall be brought to prompt publication. There can hardly be two opinions on the desirableness of immediately working out such problems in these great districts which in their past and present history offer examples of instructive geological structure and great bullion yield, and which have required of mining men special mechanical skill and large outlay of capital. Proper scientific reports on such typical districts become records of remarkable phenomena in the field of industrial geology and chronicles of distinguished success in the department of mining engineering. Among the great numbers of mining districts which merit rigid investigation I have chosen three, which more than others seemed to offer harvests of technical information, of which the mining population stands in immediate need. Leadville, the extraordinary district in Middle Colorado; Eureka, Nevada, which for fifteen years has been the most productive silver-lead district in America, and the incomparable Comstock Lode, are chosen as the first three districts to be illustrated by special monographs.

OFFICIAL RECORDS, DISBURSEMENTS, AND MONEY RESPONSIBILITY.

The following report of the chief clerk at the Washington office will give full information as to the methods of preserving official records, and of transacting all business pertaining to disbursements and money accountability; also the records of the purchase, responsibility for, transfer, and final disposition of public property.

In general, the blanks for disbursements and money accountability are modeled on those of the Corps of Engineers of the Army, though certain modifications to meet the demands of the peculiar field service of the Geological Survey have been introduced.

UNITED STATES GEOLOGICAL SURVEY,
OFFICE OF THE DIRECTOR,
Washington, D. C., September 13, 1880.

Hon. CLARENCE KING,
Director United States Geological Survey, San Francisco, Cal. :

SIR: I have the honor to submit a report of the operations of the office work during the fiscal year ending June 30, 1880, the duties of which are principally as follows:

Keeping a record of all communications sent or received, also of money and property responsibility of all disbursing officers connected with the bureau, and examining all accounts for the same, and making up and paying all accounts pertaining to the Washington office.

The average clerical force for the year is three.

During the fiscal year ending June 30, 1880—

954 letters have been received, briefed, and entered in book of "Letters Received," and indexed.

973 letters written, and indorsements made, which have been copied in the book of "Letters Sent," and indexed.

726 money accounts and 21 property returns have been received, examined, booked, and those pertaining to money accountability transmitted to the Treasury Department for settlement.

The following is the method, briefly stated, of keeping the records and transacting the clerical business of the office.

RECORD DIVISION.

Book 1 is designated "Letters Received," into which a brief of all communications, necessary or proper to be recorded, are entered and numbered, beginning with the first, and ending with the last entry for a year.

Book 2 is designated "Letters Sent," into which all communications sent out of the office are copied. A continuous index is kept, giving the subject-matter of all communications sent and received, from day to day.

Book 3 is designated "Applications," into which all communications received from or relating to applicants for employment are entered.

Book 4, "Public Property Shipped," is designed to keep a complete record of all public property shipped, giving date, to whom sent and where, by what conveyance, for whom, contents, weight or measurement, rate, &c.

Book 5, "Public Property Received," is designed to keep a record of all public property received from time to time, which is similar in form to that of "Public Property Shipped."

MONEY AND PROPERTY DIVISION.

Book 6, "Ledger of Disbursements," is designed to keep an open debit and credit account with each disbursing officer of the bureau, also of appropriations made from year to year.

Book 7, "Consolidated Account Current," is designed to show a recapitulation of amounts of public funds in hands of disbursing officers as per their last report, received since, expended or otherwise disposed of, and remaining on hand at end of each quarter.

Book 8, "Record of Vouchers Paid," is designed to show all accounts paid, giving date of purchase and payment. From whom purchased and by whom rendered. By whom paid, and where. Articles or services.

Book 9, "Classification of Expenditures," designed to show the amounts paid under different heads.

Book 10, "Consolidated Return of Property," designed to show all public property belonging to the bureau. Received, disposed of, and remaining on hand each quarter.

Book 11, "Record of Allotment," is designed to keep a record of amounts allotted each division of the survey for the fiscal year's work.

Book 12, "Record of Appropriation," is designed to keep a record of all appropriations made for the Geological Survey, giving date of approval of act, title of act, detailed object of appropriation.

Book 13, "Accounts of Disbursing Officers settled at the Treasury Department," designed to give name, address, or station. Date of rendition of accounts. Number of settlement. For what period. Amount of differences and cause.

The following circular, issued from this office, will show the reports required to be rendered by, and the instructions given to disbursing officers of the survey.

CIRCULAR NO. 3.

"DEPARTMENT OF THE INTERIOR,
 "UNITED STATES GEOLOGICAL SURVEY, OFFICE OF THE DIRECTOR,
 "Washington, D. C., April 1, 1880.

"To facilitate and secure accuracy and promptness in the transaction of official business by disbursing officers of the United States Geological Survey, the following instructions and list of reports to be rendered are published for their information and guidance.

"WEEKLY.

"Statement of public funds on hand and where deposited.

"MONTHLY.

"Report of transportation requests issued over bonded roads, giving name of person transported, between what points, and cost of same.

"Report of persons and articles hired.

"QUARTERLY.

"Account current (in duplicate) with abstract of disbursements signed (in duplicate), with one set of vouchers, will be rendered to the director within twenty days after expiration of the quarter to which they pertain.

"In making accounts, disbursing officers will be governed by the following rules

"1. All accounts accruing during any quarter should be adjusted and paid during the current quarter.

"2. Accounts for expenditures of disbursing officers must bear dates, and all receipts upon vouchers must bear the date when they were paid.

"3. The receipts which are annexed to accounts should express the sums paid in words, legibly written out in full, and also by figures; and they should state the name of the person from whom the money is received (i. e., the disbursing officer) and the date when paid.

"4. In all accounts for articles purchased, the date of each purchase, the name, quantities, and rate per unit of each article must be distinctly specified in the account. For instance:

"Feb. 29, 1880, 250 pounds of oats, at .02 cents per pound=\$5.

"5. Subvouchers are desirable, and should be appended to all vouchers when it is practicable to obtain them. When they cannot be obtained, a certificate to that effect should be added to the voucher.

"6. Subvouchers must be made out in ink, and no item should appear on a subvoucher for which payment has not been actually made to the person whose name it bears; and when signed by an employé they are inadmissible.

"7. When money is paid to a person unable to write his name, it should be written for him, and then he should make his mark, which should be witnessed by some person other than the disbursing officer.

"8. Receipts for payments should, whenever practicable, be signed by a principal, and not by an agent. When signed by an agent, he should sign his name in full; and the fact of his agency should be certified to by the disbursing officer.

"9. Disbursing officers should sign their accounts, and all other papers pertaining thereto, by the title under which they disburse, i. e., "John Doe, disbursing agent," not "geologist."

"10. Disbursing officers have no authority to discount a United States Treasury draft or check.

"11. When transportation of funds by express or other public mode of conveyance becomes requisite, the necessary expenses are a proper charge against the government.

"12. When one is paid an annual salary, amounts due for fractional parts of the year or month should be taken from the salary tables used by the Treasury Department. Where salaries are monthly, amounts for fractional parts of a month should be computed according to the number of days the month may contain. The dates should be given, stating whether inclusive or not. For instance: A person employed from May 28 to June 12, inclusive, would have served 16 days, which, at \$30 per month, would amount to \$15.87. Thus:

"May 28 to 31, 4 days, at $\frac{3}{4}$ dollar = \$3.87.

"June 1 to 12, 12 days, at $\frac{1}{2}$ dollars = 12 0' = \$15.87.

"13. Actual traveling expenses usual and essential to the ordinary comfort of travelers will be allowed, which will embrace the following items of expenditures only, viz: Cost actually paid for fares upon railroads (other than those bonded, over which

transportation requests will be issued by the Geological Director), stages, steamboats, or other usual modes of conveyance, *i. e.*, street-car or omnibus or transfer-coach fare to and from depots and hotels; and, when there are no such conveyances, moderate and necessary hack hire, not exceeding legal rates, and baggage fees to porters; sleeping-car fare for one double berth for each person, or customary stateroom and accommodations on boats. When delays at hotels are incident to, and necessary for, the performance of the duties for which the travel is ordered, charges for hotel expenses will be allowed, not exceeding \$4 per day, and bills should always be obtained and filed as subvouchers to the account, giving the dates of arrival and departure and the rate per day. No charges will be allowed for hotel bills when the detention is unnecessary for the execution of the orders under which the journey is performed. Meals furnished on steamers or other means of conveyance which are included in the charge for fare will not, of course, be made an extra charge. Whenever special expenditures are made for meals they will be allowed, but for no other items of refreshment than the ordinary food provided for travelers. Travel must be covered by a specific order in the case, issued by authority of the Director previous to the commencement of the journey, or confirmed by him as soon thereafter as practicable. The items above authorized will appear in detail upon the voucher or memorandum attached thereto, together with subvouchers in all cases when practicable. No other items of whatever nature will be allowed.

"No account or pay-roll should be so made up as to involve payments from the appropriations for more than one fiscal year.

"Balances from the appropriations for one fiscal year cannot be applied to payment of indebtedness incurred during another fiscal year, unless it be in fulfillment of expenses incurred, or of contracts properly made, within that year.

"One copy of property return, with vouchers complete pertaining thereto.

"All articles to be itemized and classed under the following heads, alphabetically arranged:

"1. Fuel.

"2. Forage.

"3. Stationery, including drawing material.

"4. Office furniture.

"5. Camp and field equipage.

"6. Means of transportation.

"7. Subsistence.

"8. Instruments.

"9. Photographic instruments and material.

"10. Laboratory instruments and material.

"11. Miscellaneous stores, such as lumber, rope, nails, canvas, soap, candles, tools, and material for general repairs.

"No disbursing officer making a return of public property will drop from his return any articles as worn out or unserviceable until they have been condemned, after proper inspection, and ordered to be dropped or otherwise disposed of.

"A full report of all public property considered worn out or unserviceable will be made to the Director at the end of each quarter, if practicable, with such explanatory remarks as may seem to be required, after which orders as to the inspection or disposition of the same will be issued.

"Property intrusted to assistants and employes of the Survey will be carefully charged against them, and in case of loss the money value will be withheld unless said loss be unavoidable and satisfactorily explained. Affidavits and statements will be made up at the time of loss. Too great care of instruments and other property cannot be exercised by persons connected with the Survey.

"CLARENCE KING, *Director.*"

A list of blank forms and vouchers adopted for use of this office, with corresponding Interior Department numbers, is herewith appended:

9001—Estimate of Funds.

9002—Reply to Estimate of Funds.

9003—Weekly Statement of Public Funds.

9004—Notice that Funds have been Remitted.

9008—Requisition for Funds.

9009—Voucher of Disbursements.

9010—Requisition for Printing and Binding.

9011—Requisition for Stationery.

9012—Inspection Reports.

9013—Account Current.

9014—Quarterly Returns of Property.

9016—Pay Roll.

9017—Invoice of Property.

9019—Receipts for Property.

9020—Abstracts of Disbursements.

- 9021—Affidavits as to Property.
- 9022—Estimate for Stamps.
- 9023—Return of Stamps.
- 9024—Notification of Receipt of Accounts.
- 9025—Abstracts of Weekly Statements.
- 9026—Acknowledgment of Receipt of Circulars.
- 9027—Acknowledgment of Receipt of Communications.
- 9028—Pay Voucher.
- 9029—Letter Transmitting Checks in Payment of Accounts.
- 9030—Letter inclosing Accounts for Signature.
- Leave of Absence Blanks.
- Letter containing Bureau Regulations relative to Appointments.
- Report of Persons and Articles hired.
- Orders for Journeys.
- Transportation Requests over Bonded Railroads.
- Orders for Supplies.

Very respectfully, your obedient servant,

JOHN D. MCCHESENEY,
Chief Disbursing Clerk.

APPOINTMENTS.

By the sanction of the honorable the Secretary of the Interior, appointments to the Geological Survey are divided into two classes: First. Members of the regular and permanent corps of the Survey, who are nominated by the Director and appointed by the Secretary, their appointments being made out and oath of office being filed in the Appointment Division of the Department of the Interior. Second. Temporary appointments, which the Director is authorized to make and revoke.

In organizing the Geological Corps, the greatest care has been taken in the selection of appointees. The following letter, which is returned to applicants for position, will convey an idea of the high character of requirements which is demanded of every member of the Survey:

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY, OFFICE OF THE DIRECTOR,
Washington, D. C., 1880.

_____, _____, _____:

SIR: Your communication of _____, relating to a position for _____ upon the staff of the United States Geological Survey, has been received and placed upon file.

Your attention is respectfully called to the following Bureau Regulations concerning appointment:

"The Geological Survey is divided into two independent divisions. These are:

"1. General Geology. 2. Mining Geology.

"Applicants for appointment under the Division of General Geology will be required to furnish proper evidence of a good working knowledge of mathematics, physics, chemistry, geology, and mineralogy. Such evidence will consist of the degrees of universities, or the testimony of experts in the required branches, or the result of a written examination.

"Applicants for appointment under the Division of Mining Geology must furnish equivalent evidence of a working knowledge of mathematics, mechanics, mining geology, chemistry, metallurgy, and the mineralogy of economic mineral products."

You are requested to comply with the above requirements, and present your scientific credentials.

Very respectfully,

CLARENCE KING, *Director.*

The following is the list of the *personnel* of the Survey, giving the position or character of duty, the dates of appointment, promotion, and resignation, and the annual salary:

Personnel of the United States Geological Survey.

Number.	Name.	Position.	Salary.		Date of appointment.	Remarks.
			Annual.	Monthly.		
1	King, Clarence	Director	\$3,000 00		May 24, 1879	
2	Emmons, Sam'l F.	Geologist	4,000 00		Aug. 15, 1879	
3	Hague, Arnold	Geologist	4,000 00			Reported Apr. 9, 1880.
4	Gilbert, G. K.	Geologist	4,000 00		July 10, 1879	
5	Hayden, F. V.	Geologist	4,000 00		July 19, 1879	
6	Pumpelly, Raphael	Geologist	4,000 00		July 16, 1879	
7	Becker, Geo. F.	Geologist	2,500 00		July 22, 1879	
8	Wilson, A. D.	Chief topographer	4,000 00		July 1, 1880	Promoted July 1, 1880.
9	Clark, Fred A.	Topographer	3,000 00		July 10, 1879	
10	Lord, Eliot	Clerk	2,500 00		July 9, 1879	Resigned Sept. 30, 1879.
11	Banga, Jas. E.	Disbursing clerk	1,800 00		July 9, 1879	
12	Bodfish, Sumner H.	Topographer	2,000 00		July 1, 1880	Promoted July 1, 1880.
13	Foote, Arthur D.	Assistant geologist	1,800 00		July 10, 1879	
14	Renshawe, Jno. H.	Topographer	1,800 00		July 25, 1879	Resigned Aug. 31, 1879.
15	Goode, Richard U.	Topographer	1,700 00		July 10, 1879	Resignation request'd, not yet received.
16	Wright, Philo B.	Topographer	1,200 00		July 12, 1879	
17	Smith, Chas. E.	Clerk	800 00		July 10, 1879	Resigned June 30, 1880.
18	Wilson, C. C.	Clerk	840 00		July 10, 1879	Resigned Oct. 22, 1879.
19	Wallace, H. S.	Clerk	600 00		July 9, 1879	
20	Walcott, Chas. D.	Assistant geologist	1,200 00		July 1, 1880	Promoted July 1, 1880.
21	Meador, Leake S.	Messenger	600 00		July 10, 1879	
22	Mason, Anthony	Messenger	480 00		July 21, 1879	Promoted July 1, 1880.
23	Blair, Andrew A.	Geologist	2 25	per diem	July 9, 1879	Promoted July 1, 1880.
24	Kimball, J. P.	Geologist	840 00		July 9, 1879	Resigned Jan. 31, 1880.
25	McChesney, Jno. D.	Chief dis'b'g clerk	2 25	per diem	July 9, 1879	
26	Price, Gran	Watchman	840 00		Feb. 1, 1880	Promoted Feb. 1, 1880.
27	Wheeler, Patrick	Watchman	3,000 00		Sept. 10, 1879	
28	Baldwin, Jeremiah	Messenger	3,000 00		Sept. 10, 1879	
29	Hanford, Chas. B.	Watchman	2,400 00		Jan. 1, 1880	
30	Manners, Edw'd C.	Clerk	600 00		Feb. 1, 1880	
31	Reade, Francis R.	Assistant geologist	600 00		Feb. 1, 1880	
32	Thompson, Gilbert	Topographer	1,000 00		Apr. 1, 1880	Temporary appointment by Director.
33	Leffingwell, Wm. H.	Ass't topographer	2,500 00	\$100 00	Apr. 7, 1880	Temporary appointment by Director.
34	Jacob, Ernst	Assistant geologist	75 00		May 1, 1880	Resigned Sept. 1, 1880.
35	Hillebrand, W. F.	Chemist	2,500 00		May 1, 1880	
36	Lakes, Arthur	Assistant geologist	1,200 00		July 1, 1880	Temporary appointment by Director.
37	Wilson, Geo. H.	Ass't topographer	2,000 00	100 00	July 1, 1880	Temporary appointment by Director.
38	Iddings, Joa. P.	Assistant geologist		100 00	June 23, 1880	Temporary appointment by Director.
39	O'Sullivan, T. H.	Photographer		75 00	July 1, 1880	Temporary appointment by Director.
				100 00	July 16, 1880	Temporary appointment by Director.

CASH STATEMENT.

The following cash statement, submitted by John D. McChesney, chief disbursing clerk, gives the quarterly and annual total disbursements expended by each disbursing officer, and the total for the bureau for the year.

To this statement is appended a classification of expenditures made from the appropriation for the fiscal year ending June 30.

The unexpended balance of \$20,624.43 is reserved for the payment of the experts engaged in the collection of the statistics of the mineral productions in the Western States and Territories. It is an expense incurred to cover a period of the last fiscal year, and its results will be embodied in a volume upon the precious metals.

Cash statement for fiscal year ending June 30, 1880.

Name of disbursing officer.	Third quarter, 1879.	Fourth quarter, 1879.	First quarter, 1880.	Second quarter, 1880.	Total amount expended.	Balance on hand June 30, 1880, required to pay outstanding li- abilities.
1. George F. Becker		\$1,000 48	\$1,384 77	\$3,848 95	\$6,234 20	\$11,265 80
2. James E. Bangs	\$8,243 50	8,523 80	1,261 60	2,873 98	20,902 88	97 12
3. Sumner H. Bodfish	1,964 03	4,463 61			6,417 64	
4. Samuel F. Emmons	1,984 62	2,715 85	2,705 53	3,094 81	10,500 31	7,999 69
5. G. K. Gilbert	25 60	2,621 78	828 81	5,399 64	8,865 83	1,134 17
6. John D. McChesney			10,044 69	14,235 03	24,279 72	120 28
7. Amount of accounts of bonded rail- roads charged to appropriation 1879-'80					2,174 99	
8. Balance to credit of appropriation June 30, 1880						7 87
Total	12,207 75	19,325 52	16,225 40	29,441 91	79,375 57	20,624 43

Appropriation for the fiscal year ending June 30, 1880, act approved March 3, 1879. \$100,000 00

Amount expended from appropriations for United States Geological Survey for the fiscal
year ending June 30, 1880. 79,375 57

Amount remaining unexpended June 30, 1880 (required to meet outstanding liabilities). 20,624 43

Respectfully submitted.

JOHN D. MCCHESENEY,
Chief Disbursing Clerk, U. S. G. S.

*Classification of expenditures made from appropriation for United States Geological Survey
for the fiscal year ending June 30, 1880.*

No.	Amount.
1. Fuel	\$457 53
2. Forage	1,293 68
3. Stationery	1,705 73
4. Drawing material	81 42
5. Office furniture	5,430 85
6. Rent of office	733 33
7. Repairs of office	938 10
8. Rent of telephones	71 16
9. Rent of post-office boxes	42 00
10. Gas	57 09
11. Ice	16 78
12. Services of assistants and employés	46,846 98
13. Telegrams	569 83
14. Transportation	2,944 43
15. Traveling expenses	5,049 44
16. Storage	44 16
17. Tollage	10 50
18. Instruments purchased	1,948 88
19. Instruments repaired	715 15
20. Camp and field equipage	1,029 27
21. Subsistence	3,303 16
22. Photographical material	6 75
23. Laboratory material	2 25
24. Job printing	25 50
25. Apprehension and delivery of lost public property	25 00
26. Freight	718 86
27. Pasturage	409 25
28. Horses	153 00
29. Mules	1,760 00
30. Miscellaneous	812 66
	77,202 74

Amount of accounts of bonded railroads for transportation of persons and
property charged on books of Treasury Department against appropria-
tion for Geological Survey for fiscal year ending June 30, 1880. 2,174 99

Less amount of errors found in accounts for third and fourth quarters, 1879. 9 16

Total

79,375 57

STAFF REPORTS.

The following reports from members of the Geological Survey who are in charge of special departments of work, convey brief accounts of the progress made and results obtained:

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF THE ROCKY MOUNTAINS,
Denver, Colo., October 10, 1880.

HON. CLARENCE KING,

Director United States Geological Survey, Washington, D. C.:

SIR: I have the honor to submit the following report of operations in this division during the past year:

I qualified as geologist on the 15th of August, 1879, and, by your direction, at once assumed charge of this division, which embraces the State of Colorado and the Territories of New Mexico, Wyoming, Montana, and Dakota west of the one hundredth meridian.

Your instructions as contained in your letter of August 14, 1879, were as follows:

"1. You will devote the first years of the administration of your division exclusively to a study of the mineral wealth of the Rocky Mountains.

"2. Personally you will confine your investigations, till further orders, to the metallic minerals of Colorado, their geological connection, mode of occurrence and association. District by district you will acquaint yourself with the minutest features of lodes, with the legal aspect of mining, and you will prepare to furnish for the year 1880 such statistical tables as may be necessary to show, as far as practicable, gross and net product of each district and region, summing up in one general table the entire precious-metal product of Colorado.

"As far as possible you will check mine, mill, and furnace returns by the receipts of the various transportation companies, and, in general, trace the metals into actual market. In the case of base bullion, refining returns should be obtained, if the process is completed in America; if not, note to that effect should be made.

"3. You will prepare to execute, and, if possible, within two years complete, under your own personal supervision, monographs of the Leadville region, of the mining districts on the waters of Clear Creek and the Wet Mountain Valley group of districts. You will accompany your reports on these districts with topographical, geological, and mine maps, with full diagrams and sections illustrating all interesting points of lode structure. You will carefully describe all methods of mining and make full reports of all metallurgical processes, with plans and working drawings of all establishments which present peculiar interest.

"4. You will prepare to extend during the year 1880 precisely similar studies over all the mining districts of New Mexico, Colorado, Wyoming, Dakota, and Montana. In order to accomplish this, you will make requests upon this office for authority to employ the necessary corps of assistants and laborers; and there will later be allotted to you from the appropriation for the survey a sum against which you will make requisitions sufficiently large to cover the expenses of your operations.

"5. Mr. A. D. Wilson, chief topographer, will be ordered to report to you for duty in charge of the topographical survey of Leadville.

"6. You will report monthly to this office a general sketch of the progress of your operations."

In accordance with your instructions my first attention was directed to the report upon Leadville. The almost unexampled rapidity with which it had sprung from a comparatively unknown mining camp to a great mining center, whose annual production probably surpasses that of any other single district in the West, the Comstock always excepted; the unusual and peculiar character of its deposits, which were supposed to set at defiance all the known laws which govern the occurrence of mineral in other parts of the world, and to upset all geological theories; and above all, the flow of capital from the moneyed centers of the country, attracted by reports of the fabulous wealth of the mines, rendered it eminently proper that a thorough and exhaustive study should be made of its ore deposits, their geology and probable origin, &c., and moreover that the results obtained should be pushed to publication with the utmost rapidity consonant with scientific accuracy, that the public might at once be able to avail itself of practical benefit to be obtained therefrom. On the other hand, the position of Leadville is one which presents many difficulties in the way of geological research.

The city is situated on the foot of one of the western spurs of the Mosquito Range, at an altitude of 10,000 feet above sea level, while the mines are found between it and the crest of the range, from a few hundred to two and three thousand feet higher. As a consequence of this great altitude the season for field work and surface geological ob-

servations is extremely limited; over the greater part of the region barely four months in the year can be counted on as available for the advantageous prosecution of this work. Moreover, a great portion of surface, both of hill and valley, in the region of Leadville, is covered to depths often of several hundred feet with detrital material, a mixture of gravel and bowlders, originating in glacial moraines and more or less rearranged by subaerial agencies since the glacial period, thus effectually covering the underlying rocks and rendering extremely difficult the study of their structure and character. It is this feature of Leadville geology, which practically does away with the surface indications which guide the prospector and miner in other mineral districts, that has cast the glamour of mystery over these deposits. A very large number of the richest mines have been discovered quite accidentally by prospectors who dug through this gravel wherever they happened to find a piece of unoccupied ground, with a complete disregard of any previously-conceived reasons for finding ore in one place rather than in another.

The first requisite for studying satisfactorily the geology of a region, and more particularly of a mining region, where the determination must be carried out with accuracy to the minutest details, is to have it mapped with care and precision. And the peculiar character of the Leadville region, as described above, makes this still more indispensable. The preparation of the necessary maps, which, had circumstances permitted, should have been completed and printed before we commenced our geological work, was that which first occupied my attention. Mr. Wilson, with characteristic energy and promptness, accomplished in the few remaining available months of the summer and fall of 1879 the field work for a most detailed and exact map of the region containing the mines of Leadville. It was a work of no little difficulty, and involved a great deal of labor, the level lines by which he made his profiles having to be run through dense forests and over steep and almost inaccessible mountains, and could hardly have been accomplished but for his long experience and familiarity with mountain topography. The plotting of this map was done during the winter months, and field work was resumed as soon as the melting of the snow admitted of climbing the mountains. Some additional work was done upon the detailed map of Leadville, to accommodate the development of new mines, during the winter, nearer the crest of the range. A special map, on a still more enlarged scale, was made, as decided by you during the winter, of Fryer Hill; and a general map, on a less detailed scale, was constructed of the Mosquito Range for some ten miles north and south of Leadville, for the purpose of showing the general geology of the district around it. As this map did not include the mines of the Ten-mile district, a small, special map was also made of this region, whose limits, however, have been forcibly circumscribed by the unusually heavy and early snow, which put a definite stop to all field work on the 25th of September. We have now, therefore, in a more or less advanced stage of completion—

1. A detailed map of Leadville on a scale of 800 feet to the inch, with contour lines at vertical distances of 25 feet; which takes in a region between five and six miles square, and thus includes every mine of any importance, with perhaps one or two exceptions, within a radius of ten or fifteen miles of Leadville. On this map will be accurately located, not only the shafts of all producing mines, but those of most of the as yet not mineral bearing prospects, which have been used as points in determining the underground geology. This map will make two double atlas sheets.

2. A detailed map of Fryer Hill on a scale of 160 feet to the inch, with grade curves at a vertical interval of 10 feet, which will make a single atlas sheet.

3. A general map of the Park or Mosquito Range, from Quandary Peak on the north to Weston's Pass on the south, and from Leadville on the west to Fairplay on the east, or about sixteen miles by twenty. This map will be published on a scale of 2 inches to the mile, with grade curves at vertical intervals of 100 feet, and make one double atlas sheet.

4. A smaller map of the Ten-mile district, on the same scale, which will form the northern prolongation of the last-named map, and cover a district of about six miles by eight in extent.

An essential preliminary to the study of the geology of any particular district being a comprehensive view of the larger features of the geology of the whole region, I made use of every opportunity during the fall to trace the general geological connection of the other parts of Colorado with the Leadville district.

A trip from the Laramie Plains through the North and Middle Parks to Leadville gave a bird's-eye view, as it were, of the character of the second mountain uplift of the Rocky Mountain system, which forms the western border of the singular succession of depressions which have received the general name of parks. A second trip, made on the order of the Secretary of the Interior, to determine the mineral or non-mineral bearing character of the Pagosa Springs Reservation in Southern Colorado, furnished a glimpse at the great depression of the Saint Louis Park, and the remarkable volcanic ranges which form its western border. This work would have been greatly facilitated by the excellent map of the Hayden survey, whose geology in its

general features would give much useful information, were it not for the want of any systematic descriptive text.

Unfortunately, the only descriptions are contained in the somewhat hastily written field notes, which were issued annually, often before the various regions covered had been properly compared and correlated, whereas the geology of the map itself has evidently been worked up at a later date, when many modifications in the conception of the authors had been adopted and the nomenclature of peaks had been essentially changed, so that it is now almost impossible to follow their descriptions on the map. During the winter months our investigations were necessarily confined to the underground working. Commencing with the larger mines on Fryer Hill, where, from the rapidity of the extraction of ore, many portions of the ore bodies would of necessity become inaccessible by the closing in of the surrounding rock, a systematic examination of all the deposits of Leadville was begun, which, carried on in my absence by my assistant, Mr. Jacob, was continued until the melting of the snow permitted the resumption of outside work. In this way the ore deposits were traced, step by step, and their position, form, and relation to the inclosing rocks accurately determined, so that by means of the notes and specimens obtained we shall be enabled to delineate upon our maps, not only their horizontal extent and shape, but by carefully-constructed cross-sections and profiles, so graphically to represent their position in the rock masses, that the probable position of the as yet undiscovered ore horizons can be foretold by whoever has occasion to consult our reports.

The question of the probable extent and permanence of the Leadville ore is naturally one of the greatest importance to the mine owners of the district, and indeed to the mining community at large; and owing to the extremely complicated character of the geology of that region, the most experienced and scientific mining engineers often find themselves completely at a loss to know in what direction to push their explorations for new masses of ore.

A very brief outline of its general geological structure will show the reason for this uncertainty. What is now the Mosquito Range was once a series of varying silicious and calcareo-magnesian beds of Carboniferous and Silurian age, resting on a floor of granite and gneiss, along the shore of a great Archæan island, now uplifted into the Sawatch Range.

During Mesozoic time, probably towards the close of the Jura, these sedimentary beds were traversed by immense and long-continued outflows of felsitic porphyries and diorite, which spread out between the strata, mostly as regularly interbedded masses. The great dynamic movements which formed the present Rocky Mountain Ranges, and which, from the best data the geological knowledge of the present day affords, is supposed to have taken place at the close of the Cretaceous period, exercised in this region an immense horizontal pressure against the unyielding granitic mass of the Sawatch, and gradually lifted up the Carboniferous and Silurian strata and their interbedded porphyries to the heights they now occupy along the crests of the Mosquito Range. The effects of the compression of these beds was first to bend them into long, sharp folds, whose longer axes had a general direction northwest and southeast, while the steepest side of the fold was naturally on the side of the greatest resistance, viz, the west. The pressure not yet being relieved, a further effect the pushing force thus exercised was the production of great fractures or faults more or less parallel and frequently coincident with the axes of these folds, in which the uplift was almost invariably on the east. Thus the Mosquito Range presents, as it were, a series of steps, in which the beds east of these lines of fracture have been lifted relatively to their corresponding strata on the other side of the fault, from a hundred up to several thousand feet vertically, the greater fault, as might naturally be expected, occurring just west of the crest of the range more or less parallel with it, and showing a maximum movement of between two and three thousand feet.

For reasons which will be fully explained in our report, but which it were impracticable to condense into the brief limits required here, the spur lying between Iowa and Evans Gulch, upon which the mines of Leadville are situated, was more violently affected than any other by these dynamic disturbances, the result of which has been, as our map will fully show, that it is traversed in every direction by a perfect network of folds and faults. Probably no piece of ground of its size upon the continent can show such a complication of geological structure; and when we consider that since this folding and faulting took place, long ages of erosion have passed, the upper beds have gradually been worn away, great glaciers have slowly carved out the deep ravines which furrow the mountain sides, casting their *débris* of gravel and boulders upon the intervening spurs, so as to practically hide the effects of all this previous action, it is not to be wondered at that mining men have been puzzled to know the right place to look for mineral, and that courts, in endeavoring to decide the rights of the many claimants to one piece of valuable ground, by the rules of a mining law which never contemplated such a class of deposits, should give decisions which, from a geological standpoint, are utterly without reason.

Some idea of the practical waste of labor and material consequent upon the want of

a definite knowledge of the geological structure may be formed by the following figures: The number of approved mine claims in this district, of which the plats are on record in the surveyor-general's office, amounted, this summer, to something over 700. Supposing each of these had the full area allowed by law, they would cover, continuously, over ten square miles of ground, and this does not include the numberless prospect holes which have been commenced and abandoned without taking the necessary steps to secure a legal title to the ground. The hills for miles around Leadville are literally honeycombed with shafts and tunnels, probably the greater number of which are so situated that either it would be geologically impossible for them to reach the ore-bearing bed, or it would be found at such depths as, under the present conditions, to render it practically worthless when reached. These prospect holes have, however, been of the greatest value to us in our studies, furnishing, on such a large area, an actual knowledge of the relative position of the various rocks which form the earth's crust. They have been examined with great care, one by one, a labor of many months, and hundreds of specimens taken, illustrating the different characters of rocks thus exposed. It is my purpose, also, to use them as an illustration of the relative amount of productive and unproductive labor spent under the present system of mining, measurements being taken of each shaft and tunnel, which will form the basis of a calculation which shall show how much money has been put into the earth and how much taken out, in a given time. Throughout the region examined by us, a stratum of dark blue, often nearly black limestone, at the base of the Carboniferous formation, is the ore-bearing formation "par excellence."

This limestone is well characterized, both by its lithological peculiarities, and by the fossil remains found in it, and can therefore be traced with ease and certainty, once its characteristics are well understood. Other horizons there are in which ore is found; but, in general, far inferior in quality and extent to those occurring at the contact of this limestone and the porphyry, which almost everywhere overlies it. The porphyry, it is true, varies in character at different localities, and with it the character and richness of the ore; but wherever openings are made, although pay ore may not necessarily be found, evidences of mineralization are seen. By means of the field studies made this summer, we shall be enabled to lay down the outlines of all the different sedimentary and eruptive rocks occurring throughout the region, and construct accurate sections across the range, which will be published with the map, and present a graphic picture of the interior structure and the effects of the dynamic convulsions to which it has been subjected. With our map in hand, therefore, the miner will be able to trace out the ore-bearing horizons upon the surface, and in that district covered by the detailed map of Leadville, determine at any given point whether it still exists below him or has been carried away by erosion; and, if it is still there, what depth of shaft he will be obliged to sink before he can expect to reach it. In addition to the maps already mentioned, carefully-compiled diagrams of the underground workings of the principal groups of mines of Leadville, those of Fryer Hill, Carbonate Hill, Iron Hill, and Bruce Hill, are being prepared by competent engineers, on a scale of 80 feet to the inch, on which will be shown the outlines of the larger ore bodies thus far developed, both in horizontal projection and by profiles. These outlines will also be given upon the larger map of Leadville, so that the reader can see at a glance the distribution of the known bodies of ore, and draw his own conclusions as to the probability of their being formed in any particular portion of the district in which he is interested.

The present position of the ore bodies being thus defined, the question that next presents itself to the mind is: "Whence did they come?" The study of the origin of ore deposits is one upon which comparatively little systematic scientific work has been done; and which presents peculiar difficulties in its prosecution. Its results may not be of immediate practical value for any particular district, but for the advancement of the interests of mining in general they are of the utmost importance.

To this subject, therefore, considerable attention has been given, and preparations have been made to carry out the investigations thus commenced in a systematic manner, in all the mining districts, which will be reported upon in the future, in this division. It is my wish not to content myself with the simple expression of an opinion that the ore came from below or from above, but by patient research and investigation to prove definitely that it could or could not have proceeded from this or that source to which the results of our geological studies may have pointed. Chemical investigation being necessarily the essential part of such a study, it was important to secure competent chemical assistants, and to have a laboratory fitted with all the appliances requisite for the most accurate analysis of rocks and minerals. In the former respect I have been most fortunate in securing the services of Mr. W. F. Hillebrand and A. Guyard, gentlemen who have made a specialty of this branch of science, and fitted themselves under the best instructors that this country and Europe afford.

To get a suitable laboratory in this region, and with the means at my command, has, however, been a matter of much difficulty, and involving vexatious delays, as all the material had to be brought from the East, and the building itself constructed

especially for the purpose. It is now, however, in complete working order, and exhaustive investigations, both of ore and country rock, are in progress, from which I hope to derive such practical results as will amply repay the labor and expense involved. Its value as an adjunct to the investigations of mining geology cannot be overestimated.

The rapid progress made during the past few years in microscopical petrography render a microscopical examination of its rocks an essential feature of the geological study of any district, and more especially of one so rich in varieties of eruptive rocks as this. Specimens of no less than 345 different crystalline and eruptive rocks were collected in the limited region examined during our short summer's field work.

In the month of July, Mr. C. W. Cross, who had just graduated with distinction at the University of Leipzig, where he had made a special study of this branch of geology, volunteered his services for this work, and is now engaged upon a systematic examination of thin sections of these rocks.

In obedience to your instructions, duplicate and triplicate specimens of all important rocks and ore have been gathered during the work. The specimens in our collections number already over two thousand. When they shall have been worked up and carefully determined and labeled, two sets will be sent to the National Museum, at Washington, and one set preserved in the offices at Denver.

Each of these collections is to be systematically arranged, and as they accumulate, will, in time, form a representation, in miniature, of the geology of the whole country, which whoever desires may study without the expense and trouble of traveling over the mountainous regions from which they come. As time progresses I propose to make the collection at Denver a representative, not only of the ores of the precious metals and their inclosing rocks, but of all the useful material obtained from the earth, such as iron ore, coal, building stone, limestone, saline products, &c., whose value and fitness will have been previously determined by laboratory experiments. A special study has been made of the numerous smelting works of Leadville by Mr. A. Guyard, which will form an important chapter in the forthcoming report. This will include a critical examination of the processes employed, giving the composition of ore fluxes and fuel, the proportions of each in the average charge, the chemical combinations which take place at different zones in the furnace, the character and chemical composition of the products, together with some theoretical consideration of the thermic conditions under which the various chemical combinations occur.

Tables will be given showing the costs of various materials employed, the value and amount of products obtained, and the disposition of the bullion. Analysis and spectroscopic examinations will also be made of the matte, slag, and fine dust. Diagrams of all the apparatus employed, drawn to a scale, will illustrate the verbal descriptions. Should no unforeseen obstacle prevent, the manuscript of this report, of the prominent features of which I have endeavored to give a brief outline above, will be ready, according to your instruction, in January or February of the coming year.

Owing to the late date at which the appropriations of the last Congress were made, and the inadequacy of the amount apportioned for the use of this survey, work upon reports similar to the above, contemplated in your letter of instructions, upon other important mining districts of this division, has not yet been commenced; but the organization of our work is now so far advanced in perfecting the necessary administrative machinery, or the securing and training of competent assistants, the procuring of the necessary chemical and microscopical apparatus, and in ascertaining the economical importance and general geological character of the districts to be examined, that, as soon as sufficient funds are furnished, they can be prepared with greater facility and rapidity than the work already accomplished.

Very respectfully, your obedient servant,

S. F. EMMONS,
Geologist-in-charge.

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF THE GREAT BASIN,
Salt Lake City, Utah, October 1, 1880.

Hon. CLARENCE KING,

Director United States Geological Survey, Washington, D. C.

SIR: I have the honor to submit the following report on the geological field-work in the division of the Great Basin, for the year ending June 30, 1880:

The field of operations lay in Northwestern Utah and adjacent parts of Nevada and Idaho. The field work was begun in the first week of October, 1879, and was stopped by stress of weather in the middle of January following. A single party only was engaged in it. Mr. Willard Johnson, of Washington, D. C., gave most acceptable assistance in the professional part of the work, and three men were employed for camp duty.

The subject of investigation was Lake Bonneville, the great ancient lake of Utah;

and as the matter is of a somewhat special nature, a brief introduction will be necessary to show the bearings of the items of progress reported.

The Great Salt Lake Desert and a congeries of valleys connected with it were filled with water at a period so recent that the vestiges of the flood are little impaired at the present time. The sea cliffs that were carved by the dash of the ancient waves are sea cliffs still, though they stand a thousand feet above the present level of Great Salt Lake. The bars and beaches of sand and gravel that were built by the ancient currents are furrowed here and there by the rains that have since fallen on them, but they are furrowed only, and not destroyed; and the imagination is not strained to fill the gaps and restore their full contours. The fine silt that settled quietly in the deeper waters still forms the floors of the valleys. To the geologist, accustomed to speak familiarly of millions of years, it was the veriest yesterday when all these things were wrought; nor can any one who stands on the quartzite shingle of one of the old beaches, and contemplates the rounded pebbles, gleaming with the self-same polish they received when the surf laid over them, fail to be impressed by the freshness of the record.

There is a topography of the land and a topography of the water. The forms of the land are sculptured by the beating of rain and by the flow of rills, and creeks, and rivers, and they have peculiar characters accordant with their origin. The forms of the beds of lakes and oceans, and especially the forms of shores, are sculptured by the sway of waves and currents, and are distinguished by characters equally peculiar. All the hills and mountains above the shore line of Lake Bonneville bear witness of the play of subaerial agents, while below that line the slopes betray their subaqueous shaping. There is a trenchant line between them, and their peculiarities are beautifully contrasted. A careful inspection, however, shows that the sub-aqueous characters are superimposed on subaerial characters. The forms belonging to the dry land are continued down past the shore line, and the sculpture of the lake has been superficially impressed on them without entirely obliterating them. It is thus made evident that before the epoch of the lake, the land it covered was dry, just as it is now. The lake had a beginning as well as an end. It came, it lingered long enough to make an unmistakable record, and then it departed as it came.

The immediate cause of this appearance and disappearance is not at all mysterious. Both events were due to changes of climate. The lakes of the basin are now shrunken because the climate is arid. The evaporation from the surface of the land nearly balances the rainfall, and the small surplus of water gathers in the lowest depressions, forming salt lakes, from which it is finally all dissipated. The climate of the Bonneville epoch was relatively humid. There was a great surplus of unevaporated water. The basin was filled to overflowing, and sent a large river to the ocean.

The history of Lake Bonneville is therefore the history of the ancient climate of Utah, and is thereby closely linked to the material interests of the Territory. The secular cycles of climate whereby the water level was raised and lowered a thousand feet, and the water surface increased and diminished, as compared to the present surface, a thousand per cent., finds its modern counterpart in oscillations whereby the level of Great Salt Lake has recently varied through a range of 12 feet and its area through a range of 15 per cent. Whatever we can learn as to the character and cause of the greater change will contribute directly to an understanding of the lesser, and the public domain presents no more important problem to the survey. In a dozen States and Territories agriculture is restricted by the insufficiency of the water supply, and in half of them it is only here and there that a spot can be found to repay cultivation. The supply of water for a few years shows a flattering increase, and then for a like period discourages by its decrease. It is a matter of the utmost importance to determine what, on the whole, is the tendency of the climate. Is it growing moist or dry? And are there any means by which precipitation can be increased? Upon the solution of these problems will ultimately depend the population of a great district, and if the logic of events can be anticipated and the conditions of the future foretold or modified, the immigration that has begun can be duly stimulated or discouraged, and the investment of the great capital which appears to be demanded for works of irrigation can be wisely directed or wisely limited. It is partly by the study of causes and effects in meteorology, and partly by the empirical study of the history of storms that the scientific weather prediction of the day has been achieved. It may fairly be hoped that a critical investigation of the secular oscillations of climate in the past will help to solve the problem of secular change which is of such vital importance to the agriculture of an arid domain.

The preceding account of Lake Bonneville is not novel, but is a brief sketch of the results already published by the geologists of the official corps which have preceded the present. The material they put forth was for the most part acquired in an incidental way, and not by systematic search. It was the fortune of the writer, after penning his first impressions of Lake Bonneville, to renew and extend his acquaintance by means of a journey which carried him about the northern shore. The journey which was made under the auspices of the Powell survey, had for its immediate ob-

ject the cognate subject of the irrigable lands of the Salt Lake basin; and it afforded a considerable store of new facts with regard to the ancient lake. It was the purpose of last winter's field work to so complement this unpublished material that a monograph of the lake could be written. The event proved that the magnitude of the subject had been underrated; and while the investigation gave satisfactory answers to most of the pending questions of fact, it developed a host of new suggestions and new problems that seemed imperatively to demand further examinations in the field. So long as observation was indirect and cursory—at a distance as it were—the history of the lake appeared simple; but so soon as it was closely scrutinized and made a subject of special and direct study, it was found to be highly complicated—so complex, indeed, that its complete elucidation is not to be hoped for.

One of the questions proposed for solution by the field examination was a question of outlet. It had been announced by some observers that the point of outlet was at the north end of Cache Valley, at a place known as Red Rock Gap; but it was asserted by another that that point was merely the site of a strait joining to the main body of the old lake a smaller body which occupied Marsh Valley, Idaho, and which discharged the surplus water of the whole from its northern extremity. A careful study of the localities showed the former view to be the correct one. There are no shore lines in Marsh Valley, and there has been no recent barrier at its northern end. A map of the actual locality of outlet was made, and the vertical relation of the channel of outflow to the shore lines was established by means of the spirit level.

A second subject of investigation was found in the deltas of streams that were tributary to the lake. Just as the Mississippi is now throwing its detritus into the Gulf of Mexico, and slowly extending the shore of Louisiana, so in this ancient time the Bear, the Weber, the Sevier, and a multitude of smaller streams brought their tribute of gravel and sand to Lake Bonneville, and built additions to its shores. As the water slowly fell from its highest stage, new deltas were built at lower levels, and now that it has almost completely dried away, the deltas are exposed as systems of terraces grouped about the cañon mouths where the rivers issue from the mountains. These terraces are everywhere conspicuous features of the topography, and some of them are of notable magnitude. A part of Salt Lake City stands on deltas of City Creek. The cemetery at Ogden occupies an old delta of Ogden River. The Mormon temple at Logan overlooks Cache Valley from a delta of Logan River. The "Sand Ridge" between Ogden and Keyesville, now celebrated for its unirrigated farms, is the delta of Weber River; and the Union Pacific Railroad runs from Uinta to Ogden in a valley the Weber has recently excavated through the same deposit.

The successive deltas of each group record the successive water stages of the shrinking lake; and their study, which was begun but not completed, will contribute to the history of the changes of climate by which the lake surface was made to rise and fall.

A more delicate measure of the periods during which the water lingered at its various stages is found in the phenomena of bars. Wherever a current which has followed a lake shore for some distance is forced by the configuration of the bottom to turn toward deeper water, a bar is thrown out in the direction taken by the current, and this bar is increased in length and size so long as the conditions of its formation are maintained. Upon the sloping sides of the Bonneville basin there are many places where the conditions of bar formation remained practically the same, while the water level underwent considerable change, and the dimensions of the bars built at different horizons afford valuable time ratios. The study of these records was begun and carried far enough to demonstrate its importance to the investigation, but its full and satisfactory prosecution was reluctantly deferred for lack of time.

A fourth desideratum was the detailed and discriminative determination of the lake sediments. It was already known that they consisted of marls and clays and sands, but no considerable section had been measured, and no constant order of sequence had been observed. It was ascertained last winter that the marls invariably overlie the clays and form a relatively thin deposit. At one locality a beach gravel was found immediately beneath them, and in such relation as to demonstrate that a very low stage of water had intervened between two high stages. This is a capital discovery, proving, as it does, that the humid epoch was interrupted by an interval of dryness. If it be true, as argued by Mr. King and the writer, that the Bonneville epoch was synchronous with the glacial epoch, then it may also be true that the subdivision of the glacial epoch into two subepochs, with an interval of warmth, finds here a manifestation. However that may be, the discovery confirms in a most gratifying manner an independent conclusion of Mr. King's. Reasoning entirely from mineralogical facts and the necessary conditions of chemical reactions, that geologist was led to conclude that Lake La Hontan, the contemporary and neighbor of Lake Bonneville, was first flooded, for a long period, without overflow, and then, after an interval of desiccation, was refilled for a shorter period, during which there was a discharge. The history of Lake Bonneville is based purely on stratigraphic and topographic data, and is identical in every determined particular. The basin was flooded for a long period, represented by ninety feet of clay; there was then a desiccation, shown by intercalated shore deposits; and there was finally a second flood stage, represented by fifteen

of marl. The fact of overflow is proved by the discovery of the channel of discharge, and it has been shown that the second epoch of flooding was accompanied by overflow. Whether the first epoch was similarly characterized has not been ascertained, but it is a significant fact that the deposits thrown down during these two epochs have a marked difference of composition. If a relation can be established between the clay and marl as indicative of continence and overflow respectively, the parallel will be absolutely complete.

The series of local orographic movements by faulting, which had previously been shown to have followed as well as preceded the Bonneville epoch, were found to have continued also during the epoch. A shore deposit was found at one place to have been faulted and afterward covered by other shore deposits. The observation is trivial in itself, but it adds its mite to the cumulative proof of the continuity of geological processes.

The relation of the epoch to another class of phenomena is illustrated by an extinct volcano observed in the Sevier Desert. The crater was a ruin before the lake water washed its base, and it has produced no subsequent eruption; but the cooling of the central mass is not yet complete, and its warmth gives rise to a group of feeble fume-roles.

Attention was given also to the recent changes of the salt lakes, which survive the desiccation. As a consequence of the juxtaposition of two dry years, Great Salt Lake has fallen about three feet, and Sevier Lake, which in 1872 was nearly thirty miles long, has disappeared. The bed of the latter exhibits everywhere a saline mud, and in a central area this is covered by a crust of chloride of sodium and sulphate of soda several inches in thickness. During a fortnight of extreme cold at the close of the year 1879, ice was formed on the surface of Great Salt Lake, and at the same time there was a precipitation of sulphate of soda from the brine. The ice coat was thin, and its formation is not to be regarded as the cause of the precipitation. It was merely a concurrent effect of the fall of temperature, which diminished the power of the water to hold the salt in solution. The precipitate was redissolved in the course of a few weeks.

For the double purpose of study and illustration a number of local maps were made by Mr. Johnson. His instrument was the plane table, and his method that of intersection. In a final report occasion will be taken to advocate the use of the plane table for work of this class, and to describe a special method of handling, which in our experience has proved economical of time.

In pursuance of the instructions of the Director of the survey that the coming field season shall be devoted to the continuation of the same investigations, a selection has been made of the lines of observation which seem most important. Active preparations are in progress for the prosecution of the following work:

1. A new and probably final map of Lake Bonneville will be prepared. The topographic base will be compiled in chief part from official data now in existence, but a small amount of territory will need to be delineated in the field. Two-thirds of the outline of the lake has already been ascertained with precision, and the remainder will be traced during the summer.

2. The history of the rise and fall of the water will be studied in detail, and in a quantitative way. Contour maps will be made of some of the best series of deltas and bars, and the spirit level will be freely used in determining their relations.

3. The relations of the lake phenomena to recent orographic displacements will be investigated. The absolute height of the highest beaches will be determined by level at enough points to show the character and amount of its distortion by the rise and fall of the country on which it is carved.

4. An effort will be made to determine the relation of the lake phenomena to the glacial phenomena of the Wasatch Mountains. According to Mr. Emmons, at least one glacier, that of Little Cottonwood Cañon, pushed its foot as low as the shore of the lake, and the conjunction of its moraines with the lake formations may confirm or controvert the theory that the Bonneville epoch is identical with the glacial.

5. The relation of the lake to the volcanism of the district will receive attention. It is already known that many basaltic outbursts occurred within the area of the lake beds before their deposition, and at least one *coulée* has spread out upon them after they were dried. An endeavor will be made to ascertain whether there were also sub-aqueous eruptions. If the ocean plays its reputed role in the production of volcanoes, then surely the volcanism of this arid region should not have ignored its only opportunity for association with a body of water.

6. Material will be gathered for the illustration of the types of topography to which lakes give rise, and especially for their comparison with certain types of land sculpture with which they have sometimes been confused.

It is believed that the material will be ready for discussion at the close of the field season.

Very respectfully, your obedient servant,

G. K. GILBERT,
Geologist-in-charge.

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF THE COLORADO,
Mount Trumbull, Ariz., September 3, 1880.

Hon. CLARENCE KING.

Director United States Geological Survey, Washington, D. C. :

SIR: On the organization of the Geological Bureau, the unfinished work of the Geographical and Geological Survey of the Rocky Mountain Region was turned over to it. This work consisted of a survey, both topographical and geological, of a territory in Southern Utah and Northern Arizona, about 70,000 square miles in extent. To complete the reports on this region, two detailed maps of special districts in Northern Arizona were necessary. One embraced the Uinkaret Mountains, an extensive group of volcanic peaks and cones; the other a portion of the Grand Cañon of the Colorado, and a great number of cañons subsidiary thereto.

For the purpose of making the topographical surveys necessary in these two districts, a party was organized, and July 16, 1879, placed under the direction of Mr. S. H. Bodfish, which, on taking the field, was divided into two branches—one being placed under the direction of Mr. John H. Renshawe, the other under the immediate direction of Mr. Bodfish himself.

Mr. Renshawe made the Survey of the Uinkaret district, Mr. Bodfish of the Grand Cañon district.

The Uinkaret district is an area of 1,475 square miles; the Grand Cañon district of 1,900 square miles. The surveys were somewhat elaborate, embracing all the details necessary to the construction of grade-curve maps on a scale of one inch to the mile—the curves representing levels of 50 feet. The Uinkaret district being a region of volcanic peaks and cones, with intervals covered with beds of lava and scoriae, presented many serious difficulties to the explorer. Again, the region was one of excessive aridity, no living stream being found, and but one living spring was known in the area. Scattered supplies of water were found at great intervals in water pockets.

The Grand Cañon district is a labyrinth of deep gorges; through its center flows the Colorado, more than 6,000 feet below the general level of the country, and the tributary cañons are profoundly carved, resulting in a district of deep gorges and towering cliffs. This survey was successfully completed.

With these topographical parties a geological party was organized, under Mr. Chas. C. Walcott, who was instructed to make a stratigraphic section from the summit of the Pink Cliffs, at the source of the Kanab, along its course through cañons to its junction with the Colorado. This section embraces a nearly unbroken series of geological formations, from the Eocene Tertiary to the base of the Carboniferous, with unconformable Devonian and Silurian rocks below. It was the purpose of this work to establish a detailed section as a standard of comparison for various subordinate sections previously made in the adjacent country. This work was successfully accomplished. A good section was made, and valuable suites of fossils collected in the several formations represented in the section.

During the past winter, Mr. Bodfish and assistants were engaged in the construction of the maps, materials for which had been collected during the field season. At the close of the fiscal year these maps were completed. At the same time Mr. Walcott had completed his report on the geology of the Kanab, with graphic sections and schedules of the fossils collected.

Assigned to the charge of this district at the beginning of the present field season, I proceeded via Salt Lake City to Kanab, a Mormon village, situated upon the southern boundary of Utah Territory, and divided the party into three divisions; one under Mr. Bodfish, one in charge of Mr. Goode, and a third under my personal direction. Each party was equipped with the necessary instruments, camp equipage, and animals, and supplied with a small corps of laborers.

Mr. Bodfish at once proceeded to the Kaibab Plateau, for the purposes of continuing the topographical work essential to the completion of the special map of that plateau, and of the Grand Cañon, and also to establish monuments and make the observations required to connect the salient points of the plateaus with the primary triangulation of this survey. This latter work is of high importance, and has long been one of the most difficult geodetic problems in the western surveys. The great expanse of the Kaibab Plateau, its great altitude, the flatness of its surface, densely clothed with timber, and the utter absence of even one eminent point upon it from which other primary points are visible, have combined to render the connection of the topography of the plateau with the general survey a very difficult matter. Several points on the terminal escarpment of the plateau, and upon the brink of the Grand Cañon, have at last been found, and monuments built thereon, which it is believed will fully connect the western and southern portions of the plateau with the geodetic work already done. Mr. Goode and myself accompanied Mr. Bodfish, the former for the purpose of becoming familiar with this ground and these monuments, which he has been instructed to observe and connect with the main triangulation from the San Francisco Mountains, a matter of no small difficulty.

One object in visiting myself the Kaibab Plateau was to inspect and ascertain the character of the work performed by Mr. Bodfish during the past year. I am very glad to be able to report that it is exceedingly successful, and that Mr. Bodfish is, in my opinion, entitled to high praise and warm congratulation for the exceedingly able and accurate manner in which he has performed one of the most difficult pieces of detail topography which can be encountered in the West. He will continue his work this season in the southern and southeastern portions of the plateau front, in those localities which are of greatest interest and moment to the geologist. Another feature of this most sublime and interesting plateau, which he will endeavor to complete this season, is the surface topography, embracing its surface drainage. I find that this topography is a remnant, and a large remnant, of an ancient drainage system, identified with the earlier evolution of the Grand Cañon, and I am fain to believe that its careful study and analysis will not only throw much light upon the geological history of this great chasm, but will be an important factor in the work of unraveling the history of the great denudation and erosion of the Plateau country.

Mr. R. U. Goode was sent, August 15, upon his dismal journey across the Colorado River, to the San Francisco Mountains, for the purpose of accomplishing the work of secondary and some primary triangulation in that district. I have instructed him to make observations from the San Francisco Peak, from Mounts Kendrick and Floyd, upon the new monuments built upon the Kaibab; also to prospect the southern slopes and mesas of that district for a suitable locality for the future measurement of a base line, and to devise a series of triangles which may be used for the contraction of the triangulation upon its extremities.

The geological work planned out for myself consists of the study of the Uinkaret Plateau, lying about fifty miles west of the Kaibab, and such accessory features of the adjoining plateaus as may suggest themselves. On the 18th of August I left Kanab for Mount Trumbull, a considerable mass which dominates the Uinkaret, and have established here a camp, as the base of operations. On my way I met, at the Pipe Spring, Mr. W. H. Holmes, who joined me to assist in the work. It is an exceedingly instructive and interesting field, and in many respects it is highly dramatic. Its surface geology is chiefly a widespread field of basalt, mostly of very modern origin, covering a platform of Carboniferous and Permian strata. More than one hundred, perhaps nearly two hundred, well-preserved craters are seen, most of them hardly touched by the ravage of time, and a few of them so fresh and black that it seems as if two or three centuries would be an extravagant estimate of their age. A considerable number of these cones are perched upon the very brink of the Grand Cañon, and have sent many *coulées* of basalt cascading down the upper walls and into the vast inner gorge.

In the magnificent Toroweap Valley, on the eastern side of the plateau, five of these grand basaltic passages, each representing numerous *coulées*, are seen pouring over a wall a thousand to fifteen hundred feet in height and spreading out over the valley below. In the Queantoweap Valley, on the western side, the same phenomenon is repeated on a similar scale. The black basalt, with the brilliant pale gray promontories of the Carboniferous jetting out between the flood, forms a striking picture.

Most instructive is the relation of the basalt to the great faults across which it has passed, and also to the Grand Cañon itself, in respect to the relative ages of these events.

Into the progress hitherto made in the study of these relations it would now be premature to enter, but I may venture to remark that it foreshadows the ascertainment of greater recency and rapidity in the cutting of the inner gorge of the Grand Cañon, and also of the great outer chasm, than would have otherwise been credited. That a very large portion of the throws of the Hurricane and Toroweap faults has been accomplished in a very recent period, is proven at once.

The lithology of the region is not rich. Nothing but highly augitic olivinitic basalt has thus far been discovered, and of this there is very little variety—too little almost to merit distinctive and critical description—as least so far as cursory macroscopic investigation has indicated. There is considerable range in the epochs of eruption, but none appear to be very ancient. A distinction may perhaps be drawn in the mode of occurrence between the older and some of the newer basalts. The more ancient appear to spread out in broad fields and to occupy the more elevated situations, forming the basaltic plateaus so well known in the Auvergne and Vivarrais, and upon the Rhine. They overlie the greater part of the Permian series, which here has great expansion and thickness, and thus form the dominating masses of Mounts Trumbull and Logan, and a basaltic plateau to the south of Logan. The newer basalts, for the most part, spread out in thin sheets, diverging from beautifully preserved and symmetrical craters, built of lapilli and peperino, and occupy lower platforms. Lithologically there is no apparent difference between the older and newer basalt—not even in the slightest.

Much interest attaches to the study of the Permian series, not only in the Uinkaret but in the adjoining plateaus. This series bids fair to assume a greater importance

than has hitherto been accorded to it. Much of the area which has hitherto been supposed to be surfaced exclusively with upper Carboniferous strata, has, in reality, a thin covering of the lowest members of the Permian. The latter lies in patches covering the gently rising knolls, while the upper Carboniferous occupies the shallows which intervene. In many places, however, the Permian is present in great force, from half to three-fourths of its entire column being preserved. An attempt will be made during the season to gain a more complete knowledge of the vertical extent and character of this important formation.

Mr. Holmes is proving to be a most invaluable coadjutor in this work, not only by the exercise of his great artistic ability in depicting the grand scenery of this locality and its very striking geological features, but equally so by his great skill and discernment in the analysis of the geological problems. His work will be of the greatest value and interest.

I have the honor to add that the health of the parties is excellent, and that great harmony and zeal are displayed by all engaged in the work.

Very respectfully, sir, your obedient servant,

C. E. DUTTON,
Captain of Ordnance in Charge.

Among the investigations in practical geology undertaken by the survey, one of the most important is the study of the geology and ore-deposits of the district of Eureka, Nev.

In order to delineate the complicated structure of the region, it was necessary that the geological field-work should be preceded by the construction of a thorough topographical map.

Accordingly, Mr. Frederick A. Clark, topographer in charge, was placed in the field with a small party, with directions to execute a grade-curve survey of twenty miles square, including the principal mining localities of the region, using a scale of 1 : 10,000, with fifty feet vertical interval between contours.

His survey having progressed sufficiently to afford advanced sheets, Mr. Arnold Hague was placed in the field, in charge of the Eureka district work. His letter, with the subjoined note of Topographer Clark, follows herewith.

EUREKA, September 30, 1880.

HON. CLARENCE KING,
Director, United States Geological Survey, Washington, D. C. :

SIR: I have the honor to present the following preliminary report upon the field-work of the United States Geological Survey, during the present season, in the Eureka district, in the State of Nevada:

In accordance with your instructions, I took the field, accompanied by two geological assistants, Mr. C. D. Walcott and Mr. Joseph P. Iddings, and immediately began preparations by establishing our first camp in New York Cañon, near the eastern base of Prospect Peak, and in the immediate neighborhood of the mines which occur along the limestone belt to the southward of Ruby Hill.

On my arrival in Eureka I found the map of the geological survey, which was to serve as the basis of our work, far less advanced than I had hoped; but the topographical party, under Mr. F. A. Clark, was then well organized, field-work was progressing rapidly, and will be completed, unless the weather proves exceptionally bad, by the 20th of December.

The topographical map, which is on a scale of 1 : 10,000, with 50-foot contours, will furnish ample detail to lay down the geological formations with great accuracy, and enable us to express the geological structure of this complicated mountain region, with its lines of faulting, which form one of its most characteristic features.

The area of the map (twenty miles square) not only permits accurately locating every mine in the district, but is sufficiently large to furnish a fine geological section across the Paleozoic rocks of Central Nevada, from the Primordial to the Coal Measures—a section that will serve as a standard for future reference.

The area covered by the map lies partly in the county of Eureka, and partly in the county of White Pine. It embraces a broad, isolated mountain region, nearly everywhere surrounded by the characteristic quaternary plains of Nevada. To the north, two parallel longitudinal ranges, the Piñon and the Diamond, border the Diamond Valley. Where they terminate to the southward, the valley is shut in, and the two ranges connected by the Eureka Mountains under consideration. To the southward a group of low hills connects, in a somewhat similar manner, these mountains with the Fish Creek range.

Topographically, the area covered by the map possesses a singularly broken expanse of mountains. Long, sharp ridges, with serrated outlines, and bold, prominent peaks, broad table-topped masses of horizontal strata, are strikingly contrasted with rough, irregular outbreaks of erupted masses.

Deep cañons, rough, steep mountain slopes, abrupt walls, shallow basins, and valleys everywhere mark the region. Indeed, it is doubtful if any area in Nevada of equal extent presents a more varied topographical character, and nowhere within the limits of the State is the dependence of the topographical upon the geological structure of the country more clearly defined than here.

The altitude of the quaternary valleys is about 6,000 feet above sea-level, while prominent peaks rise from 3,000 to 4,600 feet above these desert plains. Diamond Peak, in the extreme northeast corner of the map, has an altitude of 10,640 feet above sea-level, and Prospect Peak, in the center of the map, reaches an altitude of 9,600 feet.

As already mentioned, our first camp was made in New York Cañon, and work commenced on Prospect Mountain ridge—the most important part of the country. Owing to the occurrence of the “Richmond” and the “Eureka Consolidated” mines on Ruby Hill, and the belt of mines found on both sides of the range, Prospect Mountain ridge forms the most important uplift in the region. At the same time it embraces the oldest formations known in the district.

The entire formation, from the massive broad quartzites found on the western slopes of Prospect Peak across the overlying limestones, argillaceous and calcareous shales, down to the most easterly outlying limestone ridge, is of Primordial age. On the geological map we will, I think, be able to indicate the outlines and width of all belts of limestone and shale, showing at the same time their mutual relations. In this way we hope to show, not only the exact geological limits of the remarkable bodies of oxidized ores of Ruby Hill, but to show their relations to similar ore bodies occurring on both the east and west slopes of Prospect Mountain. This class of ore deposits in the Eureka district is confined within certain, somewhat narrow, geological limits. In addition to the structural evidences of the beds, paleontology affords clear proof of the age of these formations. We have succeeded in finding Primordial fossils throughout the entire series, from the lowest limestone stratum immediately overlying the lower quartzite of Prospect Peak to the top of the series found east of the Hamburg mine.

Directly east of Prospect Peak, along the outlying ridges of the mountain, occurs a fault along the strike of the mountain uplift.

East of this fault line are brought up well-defined Coal Measure formations, everywhere carrying paleontological evidence of the age of the horizons.

They may be traced from the entrance to New York Cañon, and the hills forming the base of Brown Mountain, behind the Richmond mill, southward to Fish Creek Valley, where they are concealed by Quaternary formations.

In places they are broken through and partially concealed by erupted masses of trachyte and rhyolite.

In general these beds are formed of light-colored limestones, more or less arenaceous, and in places passing into beds of sandstone or quartzite. From these beds we also have large collections of fossils. The strata are perfectly conformable, and belong to the Lower Coal Measure group. They carry no mineral deposits of any special value.

The Carboniferous formation extends eastward across the Pinto Toll road, forming the lower hills and ridges of the mountain mass beyond. Passing eastward, these hills fall away gradually toward a narrow cañon or gorge, whose eastern side rises in striking contrast in abrupt precipitous walls.

Along this cañon runs another great north and south fault line, bringing up still to the eastward a broad, massive body of Devonian rocks, extending from Brown Mountain southward to Fish Creek Valley. In general, it may be said to lie parallel with the Primordial and Carboniferous uplifts.

Its structure is that of a broad, gently inclined synclinal fold, the beds dipping eastward, then lying horizontal or inclined to the north with a low angle, and finally rising with a westward dip. The mass presents some fine examples of minor faulting, and the entire block is furrowed by deep, narrow cañons, showing magnificent sections of strata. There are represented here from 1,500 to 2,000 feet of rock. To the northeast of this Devonian block, the Paleozoic rocks are hidden by broad sheets of basalt, which serve to connect it, however, topographically with the uplift of the Diamond Range. Newark Mountains, situated in the northeast corner of the map, may be considered as forming the southern end of the Diamond Range. It forms a monoclinical ridge, dipping to the westward, and presents a magnificent escarpment to the eastward, rising 2,500 feet above the valley.

Probably nothing in our summer's work will have so much interest for geologists as the discovery of so great a thickness of Devonian strata, which is shown to exist here in Central Nevada.

It is estimated that there occurs here at Newark Mountain 4,500 feet of Devonian

beds, and the evidence seems quite conclusive that the Devonian hills lying to the eastward of the Pinto Toll road underlie the beds of Newark Mountain. If this is correct, we have a thickness of between 6,000 and 7,000 feet of strata.

At Newark Mountain, from the base to the summit, there occur at intervals beds carrying *brachiopods* of characteristic Devonian types.

Above the limestone of Newark Mountain occur several hundred feet of black fissile shales, crumbling easily on exposure. In places they are more or less arenaceous, and pass into thin beds of sandstone, which finally become a dark compact quartzite, again overlaid by black shales. The interesting feature of these shale beds is, that they are the exact equivalent of the black shales of White Pine—a formation that heretofore has never been recognized except at the latter locality.

Here, at Eureka, Mr. Walcott has found several species of fossils identical with those obtained from the Hamilton black shales at White Pine.

The Devonian limestones and shales pass under the eastern base of Diamond Peak, and are lost in the plain, but are overlaid by a heavy body of quartzite, which has been referred to the Ogden quartzite of the Wahsatch section.

Conformably overlying the quartzite, and forming the top of Diamond Peak, occurs the Lower Coal Measure limestone, rich in characteristic well-known forms. Above the limestone comes a large development of conglomerate, of unknown thickness, as it is by no means certain that the upper beds are reached. From its geological position, it has been referred to the Weber quartzite, while its lithological habit bears close resemblance to similar beds in Central and Northern Nevada, and regarded by the "Geological Exploration of the Fortieth Parallel" as belonging to the same horizon.

Throughout the entire series of beds there is very little true quartzite.

Compact, reddish-brown conglomerate, filled with steel-gray, black and red nodules of cherty material, cemented with a fine ferruginous sand, is the most striking lithological feature. Interstratified in this conglomerate is a belt of gray limestone about 300 feet in thickness.

To the west of Prospect Peak ridge the geology is not sufficiently well known, as yet, to speak definitely of the formations. We have just begun work in that portion of the district.

Enough is known, however, to say that the formation consists largely of Devonian limestone—both the older and newer rocks occupying a very subordinate position.

The region is characterized by heavy faultings and displacements complicating the structure, but rarely bringing up the lower beds.

The extreme western group of hills forms a broad mass of Devonian limestone, without, however, exposing a heavy thickness of strata. The beds incline from the central mass, with gentle dips, in all directions presenting roughly a dome-shaped body.

One of the most interesting geological features of this portion of the district is found at Lone Mountain, where the Silurian and Devonian strata occur, perfectly conformable, without any breaks, with both structural and paleontological evidence of their true position. We here have 4,000 feet of conformable beds with organic remains throughout the series. The Devonian beds are easily correlated with the beds to the eastward.

Already we have large paleontological collections from the Silurian, Devonian, and Carboniferous rocks, and every day important and valuable additions are made, filling up the known gaps, and more closely defining the different horizons.

From the Devonian Rocks our collection is already very extensive. Nearly all the genera and species brought in by the "Geological Exploration of the Fortieth Parallel," from White Pine, Piñon Range, and one or two other localities, have been recognized as occurring here.

The Tertiary volcanic rocks of the district cover large areas and present some interesting features. They have been carefully mapped, and their relations to the Palæozoic uplifts studied.

A matter of great interest, geologically, and of considerable importance in mining and economic questions, is the connection between the great lines of faulting and points of greatest weakness in the sedimentary beds, with the lines of volcanic outbursts. These points, I think, will be fully brought out when the geological map of the district is published.

Trachytes, rhyolites, rhyolitic tufas, basalts, represent the varieties of Tertiary volcanic rocks as yet discovered in the district. These, however, are all well displayed, and Mr. Iddings has made large collections from the different outbursts, showing every variety of rock. In addition to the cabinet specimens obtained, thin fragments, or "chips," are collected from each locality for the purpose of preparing microscopic sections of the rock, without afterwards injuring the larger specimens.

All investigations of the sequence of volcanic rocks fully confirms the order laid down in the work of the "Geological Exploration of the Fortieth Parallel." The order is always the same—trachytes, rhyolites, basalts.

Perhaps the most interesting part of the volcanic geology is the abundant evidence of the position of the tufa beds.

These tufas cover much the largest area of any of the erupted masses. They are not only widely distributed, but extend in a nearly continuous line from the entrance of Eureka Cañon, across the "Pinto Divide," the Pinto Basin, and southward to Fish Creek Valley, where their limits are concealed by the Quaternary plain. Wherever observed in connection with trachytes, the tufas are always seen resting upon the uneven surfaces of the former rock, and presenting no products of alteration along the lines of contact.

Rhyolites and basalts, on the contrary, are observed cutting and capping the tufa with exceedingly interesting contact products—pearlites and glassy rocks produced by rapid cooling.

It is my intention to furnish, with the final report, two complete geological sections, drawn to a natural scale, across the map from west to east—one across the center of the map, through Prospect Peak, the other in the neighborhood of Ruby Hill and the trachytic mass of Brown Mountain. In addition to the above, there may be several short sections, illustrating special points in the geological structure of the district.

In reading this report I trust you will bear in mind that it represents less than three months of geological field work, and on none of the questions treated can our work be said to be completed. Large areas of the country have not, as yet, even been visited.

Very respectfully, your obedient servant,

ARNOLD HAGUE,
Geologist-in-charge.

UNITED STATES GEOLOGICAL SURVEY, DIVISION OF THE GREAT BASIN,
Eureka, Nev., September 14, 1880.

Hon. CLARENCE KING,

Director, United States Geological Survey, Washington, D. C. :

Sir: I have the honor, in accordance with order of the director, to submit the following report upon the Eureka topographical survey, to June 30, 1880.

Ordered to the charge of this work upon July 17, 1879, I arrived at Eureka, Nev., on August 5. A rapid examination of the country, with view of including twenty square miles in the survey, showed that it would be difficult to find a section more complete in the requisites for a handsome map; there being some 3,000 feet range of elevation, great variety of form, and character strongly marked.

Delayed in making of outfit, camp was pitched on August 11, 1879, in Spring Valley, some four miles northwest of town. Here a base of 9,000 feet in length, over 183 feet range of level, was twice measured with a Stackpole compensated steel tape, giving a difference of 0.083 feet in the two runs. Triangulation, with an average length of side of one mile was developed; primarily upon the pentagonal plan, and so continued as far as the character of the country, condition of angles, and topographical necessities made advisable.

Owing to lateness of season and consequent small party, both triangulation and topography were carried on together—a very objectionable method. A gradientor was used in triangulation; in topography, a plane table. The scale chosen by home office was three miles to one inch for horizontal, and fifty feet interval between contours. Later in the season, however, by advice and consent of the director, the scale of 1:10,000 was adopted as being the more convenient and best adapted for thorough representation of so varied topography.

The field season lasted ninety-three days, being closed by heavy snows. The result of the season was: Triangulation stations established, 47; square miles of topography obtained, 25.

A furnished house was rented in Eureka, and during the winter a survey was made of the town, and office work of computation and compilation was performed.

Early in 1880 recommendations and estimates for completion of the Eureka survey, including about one square mile of the more important mining region upon ten-foot contours, was asked for by, and furnished to, the director. Consequent upon plan approved and authority granted, it is confidently expected that the Eureka survey will be completed by December 1, 1880.

Camp was formed on May 10, but inclement weather prevented the obtaining much topography before middle of June. Since that date progress has been very rapid, and by making a triangulation party and two plane-table parties, there has this season, to date of June 30, 1880, been accomplished: Triangulation stations occupied, 141; square miles topography obtained, 36. Making a total to date of: Triangulation stations, 188; square miles topography, 61.

My grateful acknowledgments are due and tendered Mr. George H. Wilson, assistant topographer, and Mr. G. Olivio Newman, in charge of the triangulation, for constant energy displayed in prosecution of their labors and interest manifested in development of the Eureka surveys.

I am, sir, very respectfully, your obedient servant,

FRED. A. CLARK, *Topographer.*

Respectfully forwarded through Mr. Arnold Hague, geologist in charge, division of the Pacific.



UNITED STATES GEOLOGICAL SURVEY,
Virginia, Nev., October 10, 1880.

Hon. CLARENCE KING,

Director, United States Geological Survey, Washington, D. C. :

SIR: I have the honor to submit to you the following report of my work under the survey during the past year.

My attention has been directed, under your orders, to three subjects:

First. A reconnaissance of the San Francisco district in Southern Utah, the Eureka district in Nevada, and the Bodie district in California, with a view to laying plans for comprehensive reports upon each of them in the near future.

Second. A statistical investigation of the mineral industries west of the Mississippi. On this subject I have made a separate report, as special agent of the census.

Third. A detailed investigation of the geology of the Comstock Lode, which is still in progress, and which cannot be satisfactorily completed for some months to come.

In the following pages, I shall have the the honor of reporting upon the first and last of these subjects, in such detail as seems appropriate.

RECONNAISSANCE OF THE SAN FRANCISCO, EUREKA, AND BODIE DISTRICTS.

The San Francisco district, which I visited in October, 1878, lies in Beaver County, Utah, about a short range of mountains, with a nearly north and south trend, bearing the same name as the district. The most southerly of these mountains, the Grampian, is apparently a monoclinal, though not improbably a faulted anticlinal composed of highly metamorphic and dislocated quartzites and dolomites, dipping to the west and north at angles of from twenty degrees to twenty-five degrees. These rocks are probably Carboniferous. They contain no fossils, but fossil deposits occur within a few miles, and the age could most likely be inferentially established without difficulty. Next north of the Grampian is a granite mountain, and cutting both metamorphics and granite, are dikes of Tertiary volcanic rocks, which cover the country for a long distance to the east.

Among the volcanic rocks I have identified microscopically are hornblende-andesite, augite-andesite, trachyte, and rhyolite. The andesites crop only to a slight extent, but there is reason to believe that they are extensively represented at a short distance from the surface.

The granite, the metamorphic rocks, and the volcanic rocks all show ore-bearing veins, but the great mine of the district, the Horn-Silver, is on the contact between the metamorphic and volcanic rocks at the foot of the Grampian Mountain. At the surface the east wall of the Horn-Silver is trachyte, but large masses of andesite certainly underlie the trachyte at a short distance to the east, and it is probable that it forms the east wall at a short distance underground. The walls are exposed in only one or two places in the mine, and not to a sufficient extent, at the time of my visit, to enable me to make any satisfactory determination.

The Horn-Silver is a vast ore-body, nearly or quite without waste, and the estimate of 500,000 tons in sight did not appear to me excessive. This is the estimate of Mr. W. A. Hooker, of New York, who carefully measured and sampled the mine. The ore is essentially anglesite, with occasional small masses of galena and disseminated particles of ruby-silver and horn-silver. It also contains selenium in some form. The mine is absolutely dry even at the six-hundred-foot level; indeed, it is so dusty, that the miners are frequently affected with lead colic.

The Carbonate mine is some three miles east of the Horn-Silver. It seems to be on a fault in andesite breccia, and presents a vein of a few feet in width, in which the galena ore fills interstices between attrition pebbles. There are, further, a great number of prospects in the district in course of development, but their importance lies in the future.

The Horn-Silver owns its own smelting works, and proposed setting up a new plant. The smelting process will afford a very excellent opportunity for an interesting metallurgical study.

The Eureka district is so well known that my short visit there, in November, 1879, enables me to add but little to the general fund of information on the subject. My efforts were mainly directed to familiarizing myself with the deposits, and making arrangements for the purchase of mine maps, &c.

The ore-bearing formation is metamorphic limestone, with traces of stratification lying on quartzite, and overlaid by shale, all of Silurian age. In this body of sedimentary origin are distributed irregular chimneys and pockets of ore, consisting in part of galena, but for the most part of sulphate and carbonate. I see some reason to believe that a portion of the carbonate has been deposited by substitution for limestone, but this point could not be absolutely determined without more time than I had to give it. The limestone has been crushed and faulted repeatedly, and in different directions, but the dynamical action seems to have preceded the formation of the ore-

bodies, since these exhibit no trace of faulting. The ore-bearing limestone lies on the slope of a short anticlinal fold, but probably extends into the adjoining synclinal, and a decrease of dip may be looked for shortly below the present workings, which reach to fifteen hundred feet below the surface.

The ore, which contains about 25 per cent. of lead and 50 ounces of silver, is smelted at Eureka, and the argentiferous lead produced by the Richmond Company is concentrated and refined on the spot. The concentration process employed is the Luce and Rozan modification of the Pattinson process (Pattinsonizing with steam agitation). So far as I know, these are the only works in the country in which this interesting process is in operation.

The principal mines of the Bodie district, which I visited early in December, 1879, are situated on the crest of a ridge running north and south, forming a spur of the Sierra chain. The mines are sunk on a system of veins cropping out on the crest of this ridge, which seems to be propylite throughout.

At the northern and highest end of the ridge the rock is much decomposed, and the pyritous minerals are converted into gossan. The vein matter is soft, and the gold free, but highly argentiferous, being worth only ten or twelve dollars per ounce. South of the Standard and Bodie mines, at the north end of the spur (the only ones yet on a paying basis), the decomposition has not proceeded so far. At the Noonday the ore carries pyrites, argentite, and antimonial ores of silver as well as gold. The gangue at the Standard appears to be mainly quartz and clay. Farther south calcite appears in connection with the quartz, and at the Noonday is very plenty, though the calcite is often coated with a fine deposit of quartz crystals.

One hears much at Bodie of what is termed "white cap" or "blue cap," extending from the Addenda mine, which is intermediate in position between the Bodie and the Noonday, south. I examined the new shaft of the Addenda mine, which was down some hundred and fifty feet at the time of my visit, and several prospecting shafts between the Addenda and the Noonday, with a view to ascertaining the character of this surface rock. It turned out to be merely partially decomposed porphyry, the iron of which is only protoxidized. The structure of the ordinary country rock is entirely preserved, but the material has become as soft as chalk. The softening seems to take place rapidly on exposure. In places which, as I was informed by the owner, had been hard blasting ground six months previously, and where the remains of drill holes were still visible, I was able to chop the rock to a smooth shining surface with a hatchet. The rock here presented the appearance of having been decomposed from fine cracks toward the centers of the lumps, the kernels growing rounder as they diminished in size. It is possible that the small balls of hard rock, which are frequently found in the clay of the veins, have been formed in this way, though they are not probably attrition pebbles.

The Standard Company was putting up an amalgamation mill while I was in the district, on the plan in use at Virginia, but with many improvements. It will undoubtedly be the most perfect mill of its kind in the country.

THE COMSTOCK LODE.

My examination of the Comstock Lode was begun towards the close of the month of April, and has since been much interrupted by the attention necessary to organize a statistical staff under the census, and by the superintendence of the collection of the mineral statistics of the Great Basin and the Pacific slope. It will be some months before the examination of the geology, mineralogy, chemistry, and physics of this supremely important mining* district can be satisfactorily completed, and I therefore desire to state explicitly that the views here expressed are subject to modification, or even reversal, by the results hereafter to be obtained.

The Virginia Range belongs to the system of Great Basin Mountains of approximately meridional trend, which has been investigated by the geologists of the Exploration of the Fortieth Parallel. By them it has been shown that this system has resulted from a post-Jurassic disturbance, attended by the phenomena of folding and compression acting horizontally. The system as a whole, and the Virginia Range in particular, has also passed through an era of disturbances in Tertiary and post-Tertiary time, during which the vertical component of the dislocating force was greatly in excess of the horizontal. This disturbance consequently resulted in a great amount of faulting throughout the whole region, but was not attended by compression or folding.

The era of post-Jurassic disturbances was marked at or near the Comstock lode by

* Up to January 1, 1880, the Comstock had yielded in twenty years about \$325,000,000 worth of bullion. The total length of shafts and galleries is above 250 miles. The number of men employed in the mines in January, 1880, was 2,800, earning average wages of \$4 per day. At the same date 340 men were at work in the amalgamating mills.

the emergence of three massive rocks: granite, diorite, and diabase. During the Tertiary and post-Tertiary no less than eight different volcanic rocks have been ejected. These are propylite, quartz-propylite, hornblende-auesite, dacite, augite-auesite, trachyte, rhyolite, basalt. Of most of these rocks there have probably been a number of eruptions, and of one of them, trachyte, there are two varieties representing separate eruptions, which differ so greatly and constantly from one another in habitus and composition, not only in this locality, but throughout the Great Basin, as to deserve distinction as old and new trachyte.

Every one of these rocks occurs within a mile and a half of the Comstock Lode, and there is a point, somewhat east of its southern end, from which a circle can be drawn with a radius of one and a quarter miles inclosing occurrences of all eleven of them. Within this insignificant area are found about one-third of the whole known number of well-defined species of massive rocks, and there are probably few localities of the same size in the world which present so great a lithological variety. Taken in connection with the phenomenally rich and extensive vein formation of the Comstock, this complicated occurrence of massive rocks raises the geological interest of the locality to a level with its politico-economical importance.

The duration of the post-Jurassic eruptions we have perhaps no means of measuring. The Tertiary volcanic activity seems to have begun near the dawn of the Tertiary period, since which time solfataric action has probably never ceased, for traces of it are still perceptible, though on a geologically insignificant scale. The whole region has been deluged by the eruptions, and only in one or two spots have small areas of metamorphic rocks been re-exposed by erosion.

It is at the focus of this enormously prolonged volcanic activity that the Comstock Lode has been formed, and perhaps the exceptional scale of the deposit is due to the exceptional length of time during which those surface influences whose tendency is to produce the infinite dissemination of matter have been interfered with by volcanism.

If the great number of eruptions which have taken place at Virginia give the district an extraordinary interest, they increase in an equal degree the difficulty of arriving at true conclusions with respect to its geological history. Let the reader imagine successive eruptions of each of eleven different rocks within a circle of two and a half miles in diameter, in combination with a period of folding, and a second era of faults, and fancy what confusion must have resulted. If it shall prove that I have been able to make any progress toward the elucidation of the mysteries of the district, it is due in an incalculable measure to the fact that I have had before me the discussions of my predecessors, and been able to begin where they left off. The mines have also been developed to a truly astonishing extent. The Yellow Jacket shaft is, with one exception, the deepest in the world; and the total length of shafts and galleries on the lode amounts to several hundred miles. I also have the advantage of current microscopical rock determinations, a check and guide at the command of none of the geologists who have hitherto reported upon the lode.

Thus far I have come upon but one rock until now unknown in the district. This is diabase (augite and plagioclase), which is of course one of the older rocks, and appears to have immediately succeeded the diorite. Its dynamical influence will presently be evident. Augite-auesite, which was detected by the Exploration of the Fortieth Parallel, is found to occupy a much larger area than was supposed, but does not occur in direct contact with the lode.

The Comstock Lode has a nearly north and south strike. For a considerable portion of its length it is in immediate contact with the diorite mass of Mount Davidson on the west, while propylite forms its eastern wall. But about half way between its known extremities the diorite curves westward, while the lode continues its southerly direction between propylite walls. It has an average dip of about forty-three degrees to the east. It has long been supposed that the Comstock was a contact vein between propylite and diorite; but such is not the fact, as can be readily proved by constructing a section of the country from either of the published contour maps. From such a section it appears that the angle between the line of dip of the lode and the very steep face of Mount Davidson is greater than is compatible with the supposition that the former is a continuation of the latter.* On a level with the Suto tunnel (1,900 feet) enormous masses of diabase have been found on the hanging wall of the vein, and the same rock has been detected at intervals for more than a mile north of this point. The southern portion of the lode has not yet been investigated with a view to the occurrence of this rock, but the number of points at which it has already been met with seems to make it fairly certain that the Comstock fissure was formed, not by the intrusion of the Tertiary volcanic rocks, but in the post-Jurassic era, and shortly

*The Hon. Clarence King informed me privately, and before assigning me to this district, that he had come to the conclusion, from an inspection of the west wall, that the Comstock lode was on a faulting plane. Before having an opportunity of inspecting the west wall myself, I came to the same conclusion on very different grounds.

after the extrusion of the diorite. Local observations, as well as general considerations, lead to the belief that no great amount of faulting accompanied the intrusion of the diabase, and that solfataric action did not immediately set in; but the line of fissure was determined, a fact which explains the coincidence of the present line of the lode with the projecting mass of Mount Davidson for a certain distance, and its independence of the contact between the propylite and diorite at the point where this contact sweeps to the west around Mount Butler. It is a mere accident that this line of contact happens for a certain distance to coincide with the faulting plane, and were the propylite a few hundred feet deeper, both walls of the Comstock would be propylite throughout their entire length.

The system of fissuring initiated by the diabase in post-Jurassic times has been developed to an enormous extent during the Tertiary and post-Tertiary, during which the dislocating action was, as has been mentioned, more nearly normal than tangential to the earth's surface. The faulting force seems to have acted nearly in the plane of the Comstock fissure. As we proceed either east or west from this plane, parallel fissures are met with for a long distance; but in both directions the evidences of motion decrease in proportion, but not in *direct* proportion, to the distance from the vein. A vast time has undoubtedly elapsed between the earlier and later faulting movements. Here, as elsewhere, it is probable that the earth crust, once fissured, never regains its coherence, and any fresh disturbance results in a fresh movement on the old planes of fracture.

These planes of fissuring are traceable in the diorite to the west of the vein, as well as in the diabase and propylite on the east wall, and far out into the trachyte at a distance of two miles, as well as in the Comstock lode itself.

It has been supposed that these planes of fissuring indicated a bedded and nearly horizontal flow of diorite and propylite. Under this theory, the elevation of Mount Davidson is accounted for by a folding of the flowbeds. Such an hypothesis appears to me untenable. Not only is it contradicted by the evidence of the whole remarkably uniform geology of the Great Basin, but it is entirely incompatible with the observations made throughout the world in dioritic occurrences, and with many of the phenomena exhibited on the spot. Diorite, so far as is known, is not a rock which ever flows, in the proper sense of the word; that is, it does not run or spread out in sheets by its own weight, though, like granite, it has unquestionably been in a plastic condition, and capable of intrusion under heavy pressure into fissures of greater or less magnitude. Both diorite and propylite, had they ever been in a sufficiently fluid condition to be capable of a bedded flow, must have exhibited a more or less rhyolitic structure, if the flows succeeded each other at moderate intervals; or had they been separated by very long periods of time, the partings between the beds would have been marked by detritus. Neither of these indications is found parallel to the fissure planes. Propylite, it is true, occasionally shows a rhyolitic structure for a few inches in thickness, probably from some local modification of its composition; but I have met with no occurrence of this sort where the flow plane was not at a high angle to, and evidently independent of, the fissure system. The parallelism of the faulting action, as already mentioned, also extends into the trachyte, a rock still ejected from some volcanoes; its behavior as an eruptive mass is therefore known from actual observation. Moreover, while the fissure system, as such, shows a remarkable degree of parallelism and regularity, there is no approach to the absolute parallelism observed in stratified rocks or in bedded flows. Only a general regularity, with numerous local inconsistencies, is observable; indeed, the fissures often meet and cross one another. In short, the supposition of a system of faults accords with the nature of the rocks, and with the general geology of the Great Basin, while the hypothesis of bedded flows does neither. As may be supposed, the faulting of the east and west country does not show itself in parallel fissures alone. The friction of the faulted sheets grinding over one another has produced fractures innumerable in all directions, though perhaps mainly at right angles to the fissure system. In this way the rock is so broken up that it is in most places a matter of difficulty to obtain a specimen of an appropriate size for the national collection.

While the principal faulting action has been on lines parallel to the Comstock fissure, there is evidence of a certain amount of motion on planes at right angles to this direction. Such movements have been noticed more particularly in the Sierra Nevada Mine, and indicate a sinking of the country to the north of the lode. Possibly this movement was a consequence of the eruptions of trachyte, which has accumulated in enormous masses in that direction.

The vein matter of the Comstock consists of crushed and decomposed country rock, clay, and quartz. The country rock in and near the vein contains large quantities of pyrite and calcite; gypsum and some other minerals are not uncommon. The quartz is for the most part crushed to a fine mass, which has been compared to that of ordinary commercial salt. A careful examination of every occurrence I have met with shows that this quartz was once crystallized, and has been crushed by the movement of the hanging wall on the foot wall. The particles show crystal faces and fractures;

they are also of a glassy sharpness, readily producing painful cuts. That the crystals have not yielded to any internal force is evident from the fact that bunches of crystals are not uncommon, through each individual of which the same crack can be traced, showing a common and an external force.

The force requisite to crush the extensive bodies of quartz to their present sugary condition must have been enormous, but I cannot think it greater than that evinced in the condition of the east country. It is well known to mill men that in spite of the superior hardness of quartz it is one of the easiest rocks to crush in a stamp-battery, because it is far more brittle than even limestone, and the behavior of quartz under the action of blasting-powders is similar. In my opinion, the force which has reduced cubic miles of the volcanic rocks of the east country to fragments which do not average the size of an orange was quite sufficient to crush the quartz as we see it.

The Suto Tunnel, starting from the Carson Valley, penetrates the east country for a distance of twenty thousand feet, and strikes the lode near the middle of its productive portion, and over nineteen hundred feet below its highest croppings. An admirable section of the country is thus afforded, and it has been carefully studied. The rocks passed through are as follows: For the first ten thousand feet old and new trachyte alternate with augite-andesite; decomposed propylite and hornblende-andesite follow for nine thousand feet; for one thousand feet before the lode is reached the rock is diabase; while beyond the vein the diorite of Mount Davidson is encountered. Thus there have been at least seven eruptions on this line.

The determination of rocks in the Suto Tunnel and on the lode is a matter of great difficulty. The rocks for two miles east of the Comstock, underground, are in an advanced stage of decomposition, and for the most part the color, structure, and even the form of the original crystals is altered beyond recognition. Numerous microscope-slides of the rocks have been made, but it is the exception when the freshest rocks which can be obtained give satisfactory results. Some of the rocks will probably turn out indeterminate, but every effort is being made to fix beyond question the maximum possible number of occurrences.

The usual processes of decomposition of the mineral constituents of rocks either do not prevail under the peculiar chemical conditions present, or suffer an unusual number of exceptions. Thus I have found demonstrable occurrences of epidote pseudomorphic after augite, and of undichroitic viridite (green earth?) after hornblende. Such occurrences are not unknown elsewhere, but here they seem common. There are also many transformations which may easily mislead the observer. Pyrite is frequently found surrounding hornblende in such a way as to simulate deceptively the black border characteristic of hornblende-andesite. It can be detected with low powers in strong incident light. Hornblende also sometimes acquires in decomposition an opaque border of a whitish color. With high powers the light color is not perceptible. It is believed too that the real black border of magnetite is not infrequently entirely removed by decomposition.

Thus, while it is impracticable with the rocks from these mines to infer the original minerals from the secondary products, as, *e. g.*, green hornblende from epidote, the permanence even of magnetite cannot be relied upon, while what at first sight appears to be magnetite often proves to be pyrite, or some other secondary product.

It may be mentioned here as a small addition to the knowledge of the volcanic rocks that the propylite from the head of Ophir Ravine, described by Prof. Zirkel as a typical hornblende propylite, contains minute fluid inclusions, with moving bubbles. These are common in quartz-propylite, but Prof. Zirkel nowhere mentions finding them in hornblende-propylite. Fluid inclusions swarm in the diabase and diorite. In a slide from the diabase in the Suto Tunnel there are quartzes with far more liquid inclusions than in the quartz of the granite from Clark's Peak, in the North Park, Colorado, which Prof. Zirkel mentions as containing "the largest number of fluid inclusions that any rock constituent has ever been seen to hold." The fluid appears to be carbonic acid. In one of my diorite slides is an admirable hexagonal liquid inclusion in quartz, with a mobile bubble, the movements of which can be followed with a magnifying power of only sixty diameters.

Of the chemical phenomena of the lode it is almost too soon to speak, for there has been no time nor opportunity as yet for analysis or chemical experiments of any sort. An important discovery has been made in the Yellow Jacket shaft, where at a depth of three thousand and sixty-five feet a body of intensely hot water (170 F.) has been struck, which is impregnated with hydrogen sulphide. There can be no chance of mistake here, for the water was under a high pressure, and was encountered at the greatest depth yet reached on the lode. In the Sierra Nevada I also found water running from a diamond-drill hole, which smelt strongly of hydrogen sulphide, but it turned out, on inquiry, that the drill-hole passed near to and was draining an old winze. In this latter case the odoriferous gas was, no doubt, due to the reducing action of the wood-fiber on soluble sulphates. But at the Yellow Jacket no such source of error exists, and it follows as a necessary consequence that the workings have reached the level of solfataric action. This jet is the last remnant of floods of water

highly heated, and charged with active chemical reagents, which have poured through the rock for ages or eons. While all rocks, or nearly all, are permeable to water, the Comstock region is exceptionally so, for the faulting action has created capillary fissures everywhere, which no pressure can ever close. I believe it to be the sulphurous water ascending through the rock which has disseminated pyrite through it. That the pyrite is secondary is evident on inspection, for in numberless occurrences it is plain that the pyrite has replaced hornblende to a greater or less extent. This substitution can be followed with ease under the microscope, where all stages between the first attack of the bisilicate and complete pseudomorphs can often be found in the same slide. Highly heated water charged with hydrosulphuric acid will attack ferrous compounds like hornblende, and form pyrite. It will also attack feldspar, forming free silica and alkaline solutions, and it may be that the Comstock has been filled with quartz in this way. Sandberger, too, has shown that the bisilicates are, at least in many cases, the source of our metallic ores. To account for the rise of the waters through the country rock, rather than through the fissure, it is only necessary to suppose the fissure closed on some one straight or sinuous line, a supposition presenting no improbability, but rather great likelihood. The indefiniteness of the east wall of the Comstock in places (for at some points no wall could be better), is also easier of explanation on the supposition that the siliceous solution has entered the fissure through the east wall than on any other theory with which I am acquainted, for under these circumstances a partial disintegration of the east wall would inevitably ensue.

The ore channels of the Comstock lode presented a considerable theoretical difficulty, so long as the Comstock was regarded as a contact deposit; but if a fault has taken place, this difficulty, in a great measure, disappears, for, as is well understood, a vein on a faulted surface not a mathematical plane presents numerous contractions and expansions, allowing a free circulation of liquid currents in some directions and obstructing them in others.

It has been maintained that the Comstock was not a vein at all, but a sort of *Fahlband*, and that the quartz was deposited by substitution for the propylite. I am not able to find evidence for this hypothesis. The fissure, it is true, is largely filled with broken-country rock, or "horse," in a highly decomposed condition; but in the interstices, often narrow and vein-like, between these fragments of rock, the quartz frequently shows the comb-structure peculiar to masses of crystals which have separated out upon an unattacked surface. That this structure should always be perceptible is not to be expected, because here, as elsewhere, it is obliterated when the narrow opening is completely filled. Moreover, the masses of horse matter imbedded in quartz ordinarily maintain perfectly sharp, angular outlines; and to this rule I have seen no exceptions unaccompanied by sufficient evidences of motion to account for a departure from a primary form of fracture. But it is well known that wherever any process of solution attacks bodies of angular outline, it is the corners which most rapidly yield, and the kernel of undissolved material approaches more and more to a spheroidal form. A process of substitution, however, is necessarily a process of solution, and the absence of any evidence of this spheroidal development appears to me conclusive against the hypothesis, even were there no chemical difficulties in the way.

One of the most striking characteristics of the Comstock lode, indeed its most obtrusively striking characteristic, is the intense heat which prevails in its lower levels. No mines in the world approach them in the height of the temperature observed, except, perhaps, those of the Sulphur Bank, in California.*

The highest temperature on record in other districts, so far as I know, is 125 degrees, which is given by Mr. J. A. Phillips as that of the water in the Hall Clifford mine. On the twenty-seven-hundred-foot level of the Yellow Jacket, I found water at 153 degrees, and the air and rock at 126 degrees. At the bottom of the Yellow Jacket shaft the water has a temperature of 170 degrees Fahr. At the Forman shaft observations on the temperature have been taken at every hundred feet during the sinking. They show an average increase of one degree for every 34.2 feet. If these temperatures be plotted it will be found that they vibrate about a straight line, representing the rate just mentioned; and the maximum variation from the regular increase is only 4.5 degrees. Considering the irregularities in the nature of the ground which are encountered in sinking a shaft, and the inevitable influence of surface temperature, this variation cannot be considered as extraordinary. For my part, I can see no adequate explanation of the intense heat except that it is a remnant of volcanic action. That the spring at the bottom of the Yellow Jacket shaft is an active solfatara I do not doubt, and I see no reason for seeking a theory to account for it different from that which is universally held in regard to similar occurrences in the immediate neighborhood of active volcanoes. An attempt has been made to account

* The rock at the Sulphur Bank, in California, is a recent basalt, which appears to have partly overflowed the bed of Clear Lake. The mine is almost altogether an open working, and the heat consequently produces none of the technical difficulties experienced on the Comstock.

for this heat on the theory that it is produced by the kaolinization of the rock; but there appear to be very valid objections to the acceptance of this hypothesis. It is still uncertain whether kaolin results from the decomposition of triclinc feldspar or not. According to Tschermak's investigations, the decomposition of plagioclase results in the formation of a hydrated aluminium silicate containing a single molecule of water of hydration, and not two, as is the case with kaolin. No experiments have ever been made, so far as I am aware, determining, either directly or inferentially, whether heat is liberated or absorbed by the kaolinization of feldspar. In this process three steps are involved: the dissolution of the mineral into an aluminium silicate and an alkaline silicate; solution of the alkaline silicate, and hydration of the aluminium silicate. Of these three steps it is probable that the first two will absorb heat. It is also probable that the hydration will liberate heat; but whether much or little is unknown. Of the heat of hydration, all we know is that the different molecules of water in hydrated salts are combined with different degrees of chemical affinity, varying according to an unknown law. The hypothesis also appears to me to prove too much. Countless mines throughout the world have been sunk in feldspathic rocks; yet few of them show any abnormal temperature, and none exhibit phenomena comparable to those of the Comstock lode. I hope to contribute to the elucidation of this question by direct experiment.

With a view to obtaining light on the underground phenomena, I have paid considerable attention to the surface geology of the Washoe district, and shall present a new map of the surface geology on the excellent topography laid down by Lieutenant Wheeler's party. The map published by the Fortieth Parallel Exploration is, of course, correct in its main features; but dacite, not having been established as a rock species at the time of that investigation, is blended with quartz-propylite, and of course the order of succession was not established. It is hoped that the present inquiry may throw light on this subject. It also appears to me desirable to embrace a slightly greater area, and to trace contacts somewhat more in detail than has hitherto been done.

One of the delicate questions that arise in the surface geology of a district like the one under discussion is that of erosion; for the continuity of strata, which, either in its presence or by its absence, is so significant in stratified areas, is here wholly wanting. There is only a single datum which can be relied upon in eruptive regions as affording a sound basis for more or less probable hypothesis and calculation. It is self-evident that the line of contact between two rocks of different ages was also a line in the surface of the older rock at the time it was covered by the later. The eruptions in the Washoe district have been so numerous, and the contacts are so many, so long, and so sinuous, as to afford fair hope of furnishing material for an approximate reconstruction of the topography at different eras. But for this purpose they must be laid down in great detail upon the contour map. The evidences of erosion throughout the sedimentary areas of the Great Basin have been clearly read, both qualitatively and quantitatively, and it will be interesting to compare the one chain of evidences with the other. That a great amount of erosion has taken place in the Washoe district is evident from a glance at the deeply carved mountains and the precipitous cañons.

The subject of electrical currents discoverable in ore bodies, which was raised by Fox some fifty years since, has been taken up in connection with the investigation of the Comstock lode. Definite results have not as yet been reached, but the experiment will be pursued until the subject can be thoroughly discussed; and a similar series of experiments will be made at Eureka. It is not impossible that owing to the small percentage of metal in the low-grade ores now being extracted from the Comstock, negative conclusions only will be reached at Virginia, while different results may be looked for among the ore bodies of Eureka, which carry about three hundred times as much metal. Should definite laws connecting the occurrences of ores with those of electrical currents be discovered, it is probable that they would be adaptable to the discovery of ore bodies, as well as fertile in scientific interest.

My final report upon the Comstock lode will embrace, besides a discussion of the subjects mentioned and many others, a map of the mines, with all the workings complete up to January 1, 1881, probably on a scale of 100 feet to the inch; a contour map of the surface claims, on a scale of 1,500 feet to the inch; a contour map of the surface geology, on the same scale; an east and west geological section of the country through the Sutro Tunnel; and maps of the underground geology of the mines, embracing three complete horizontal sections of the lode at different levels; six vertical sections, and one longitudinal vertical projection. Much of the mapping is already done, but the whole investigation cannot be completed until the winter.

I have the honor to be, sir, your very obedient servant,

G. F. BECKER,
Geologist-in-charge.

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF MINING GEOLOGY,
Newport, R. I., September 10, 1880.

Hon. CLARENCE KING,
Director United States Geological Survey, Washington, D. C. :

SIR: I have the honor to transmit herewith a report of the progress of work performed in the laboratory of the United States Geological Survey.

Very respectfully, your obedient servant,

RAPHAEL PUMPELLY,
Geologist-in-charge.

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF MINING GEOLOGY,
Newport, R. I., September 9, 1880.

Prof. RAPHAEL PUMPELLY,
Chief of Division :

SIR: In regard to the progress of the chemical work of the United States Geological Survey, Division of Mining Geology, I have the honor to report as follows:

Since the first of October, 1879, the laboratory has been equipped and furnished in the most economical manner compatible with the character of the work required. The mechanical preparation of the samples, including the crushing and grinding of the ores, has been most thoroughly and effectively provided for, and all danger of contaminating one sample by another, or substituting one for another, most carefully guarded against.

The apparatus and contrivances used will be described in detail. For the chemical work everything necessary for rapid and careful analysis has been provided; and, besides the actual number of determinations made, much work for the investigation of and improvement in methods has been carried on, in order that, by close adherence to a high standard, only the most accurate and reliable results may issue from the laboratory. Without counting duplicates, of which a large number have been made, the actual results may be stated as follows:

Complete analyses, including separate analyses of insoluble siliceous matter . . .	29
Containing separate elements determined	696
Partial analyses, consisting of determinations of various elements in the different samples, from phosphoric acid alone to insoluble siliceous matters, silica, oxide of iron, alumina, manganese, sulphur, phosphoric acid, and titanio acid	259
Containing separate elements determined	833
Total number of samples	288
Total number of elements	1,529

These include some of the samples taken from nearly all portions of the iron field in the United States, including Michigan, Wisconsin, New Jersey, Virginia, North Carolina, Georgia, Alabama, Tennessee, and Missouri.

Very respectfully, your obedient servant,

ANDREW A. BLAIR,
Geologist and Chemist.

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,
No. 155, NEW MONTGOMERY STREET,
San Francisco, Cal., September 13, 1880.

Hon. CLARENCE KING,
Director United States Geological Survey, San Francisco, Cal. :

SIR: I have the honor to submit the following report of work done under your direction since the date of my appointment as special agent Census Office, October 1, 1879:

The monograph which I have been instructed to prepare upon the History of the Comstock Lode is not a memoir of merely local importance or interest; it is the record of a struggle which has materially affected the mining interests of the world. It is the story of the birth of the silver-mining industry in this country. It portrays as well the most vigorous growth of that industry. By the contest waged on this lode against the forces of nature, contributions of the first importance to mining science have been made, the foremost practical miners of America have been trained, and more than three hundred millions of silver and gold have been wrested from the earth. Through the contention of its rival locators our national mining legislation was mainly shaped,* and the colossal lottery of mining-stock speculation grew out of the opportunities there first offered. From this starting point the silver mines of the great inland territories have been sought out and developed, and no subsequent discoveries can rival the influence of this lode, though they may perchance excel it in richness and magnitude.

* Hon. William M. Stewart, "Legislation in 1866."

The progress of such a struggle cannot be shown by a schedule of results—a chain, so to speak, of statistical tables. Product alone is here a husk, barren of instruction, compared with the true kernel for students, the method of production. An adequate history of the Comstock lode will, therefore, prove a record of action—of a drama of industry enacted in the mountains of Nevada.

In the preparation of this record I have endeavored to make my inquiries and notes as exhaustive as possible. With a few unimportant exceptions, every facility has been offered me for obtaining the most authentic and trustworthy information accessible.

Unusual privileges have been extended to me for consulting the libraries of the pioneer societies of San Francisco, Sacramento, and Virginia City, the State Libraries at Sacramento and Carson City, the Mercantile Library and Mechanics' Institute Library of San Francisco, and, most serviceable of all for my purpose, the private collection of Mr. Hubert H. Bancroft, of this city. I have thus been enabled to examine all catalogued printed material relative to Western Utah and the Nevada mines.

The files of the California and Nevada newspapers contain by far the largest store of information, but the work of collation is necessarily slow and laborious. Of the Virginia City Territorial Enterprise, the most important record, only one approximately complete file has been preserved—the property of the Merchants' Exchange of San Francisco, stored with extreme care in the vaults of the Nevada Bank. I have examined every number of this journal, taking from it all material which I could utilize, and have made equally thorough notes from the Gold Hill News (November, 1863-'77), the Sacramento Union (1853-'70), the San Francisco Evening Bulletin (1858-'64), the San Francisco Daily Alta (1858-'65), with frequent reference to the last three papers mentioned at other periods.

From the California Courier (1849-'51), the Sacramento Transcript, the Placerville Democrat, the San Francisco Herald, the San Francisco Chronicle, and a number of other journals, I have also obtained information of value.

In the investigation of the early locations and titles on the Comstock, and the subsequent litigation, I have consulted the voluminous records in the offices of the county clerk and district recorder at Virginia City, and have used all due care to make citations and references exact and serviceable.

Through the kindness of the managing editors of the leading California and Nevada newspapers, I have been enabled to make the most extended inquiries in regard to the discovery of gold and silver in Western Utah and other undetermined points, and have been put in correspondence with pioneers and prospectors from London, Canada, to Portland, Oregon.

In all instances I have taken pains to verify and supplement printed and manuscript data by direct personal inquiries, and desire to acknowledge my particular indebtedness to Hon. William M. Stewart, Mr. John W. Mackay, Mr. Isaac E. James, superintendent Sierra Nevada Mining Company; Mr. Isaac L. Requa, superintendent Chollar Potosi Mining Company; Mr. Philip Deidesheimer, superintendent Hale & Norcross Mining Company; Mr. Alpheus Bull, Mr. William E. Wright, city editor Territorial Enterprise, and Mr. Almarin B. Paul (a few of those identified with the early and later history of the lode whom I have questioned), for their marked courtesy in communicating all desired information.

The characteristic features of the mining towns on the Comstock lode, and the work carried on above and below ground, have been objects of close personal observation; and I have embraced every opportunity as well of studying the home life, habits, and modes of thought of the miners and prospectors of Nevada.

In order to familiarize myself with the topography of the region, I have traveled on horseback and on foot over many sections of the Virginia range, and have ridden from Pyramid Lake through the valley of the Carson and its adjacent ravines, over the Sierras, following the old emigrant trail, to Sacramento. In the course of this journey I was enabled to collect such complete records from the books of the toll-stations at different points that an approximately exact estimate can be formed from them, in connection with supplementary data obtained from forwarding agents, of the amount of freight transported across the Sierras to the Comstock mining district, and the cost of building up a mining city in a barren mountain range.

During the first eight months of this investigation my work has necessarily been mainly one of inquiry, collection, and arrangement for use. In June last I began to write the memoir which I have planned. This work was temporarily suspended, however, in July by the requirements of the new charge of directly supervising the collection of certain of the statistics of the mining districts of the Pacific Coast, with which I was intrusted by your assignment.

Upon the completion of this collection I shall be enabled to prepare my report upon the history of the Comstock lode and the discovery of gold and silver in Western Utah, and to submit it for approval within an estimated period of four months.

Very respectfully, your obedient servant,

ELIOT LORD,
Special Agent Census.

No. 1910 ARCH STREET,
Philadelphia, September 14, 1880.

Hon. CLARENCE KING,
Director United States Geological Survey, Washington, D. C. :

SIR: I have the honor to present a brief report of the work assigned to me by you, in connection with the United States Geological Survey under your direction, for the fiscal year ending June 30, 1880.

In accordance with your instructions, I commenced a systematic digest of the results of the field-work and of the geological reports which had been prepared by me or under my direction for several years past, to be included in one volume.

The area proposed to be considered in this report embraced that portion of the Rocky Mountain region of the United States that lies north of New Mexico and west of the 94th meridian.

A limited classification of the work into divisions may be made, as follows :

1. A historical account of the labors of preceding explorers and geologists in the same field.
2. The general geographical features of the entire area.
3. The stratigraphical geology in detail, or the historical succession of the various formations, with a summary of the general geological features of the entire area.
4. The metamorphic and igneous rocks of the area.

These divisions will, of course, appear in sections or chapters, and may be modified or changed as the conditions may require.

On all these subjects more or less material has been collected and a mass of notes taken, which will be useful. Some of the more difficult problems in western geology, about which there have been, and are now, differences of opinion among geologists, have been considered with some care. The Laramie Group, with the overlying Tertiary deposits, has been studied so far as the time would permit.

I regret that I cannot present a more detailed report, and would not have any portion printed in a fragmentary or incomplete condition at the present time.

During much of the early portion of the fiscal year my health was in such a condition that but little work could be done, but it is now entirely restored.

Trusting that the above statement may be sufficient for your present purposes, I beg to remain,

Respectfully, your obedient servant,

F. V. HAYDEN, *Geologist.*

SAN FRANCISCO, October 1, 1880.

Hon. CLARENCE KING,
Director United States Geological Survey, Washington, D. C. :

SIR: I have the honor to submit the following notes upon the volume on "The Mechanical Appliances used in Mining and Milling on the Comstock Lode," which I am engaged in preparing under your direction.

The results of my work will consist of a volume of text and an accompanying atlas. In order to convey a correct conception of the magnitude of the Comstock machinery, it is necessary to illustrate the text by full and accurate drawings of the appliances as constructed, showing whole machines and the various important parts.

It is designed that this work shall present to the general mining world an insight into the magnitude, cost, and extent of such machinery as is now to be found in use nowhere in the world except on that great and deeply-explored lode, the Comstock.

Useful and desirable as such an exposition of the design and scale of existing machines may be, it still leaves an important and greatly desired object unaccomplished; for in all mechanical appliances, for whatever purposes they are used, their design and construction is undertaken to accomplish a certain end with the least expenditure of capital possible; and it therefore becomes necessary to determine by experimental tests, and to set forth by calculations, the excellence and efficiency of all such appliances as they are found in actual use.

Such experimental determinations, coupled with drawings and descriptions, will give to the people of the United States information as valuable as it has been difficult heretofore to obtain, enabling engineers to decide the losses due to the conversion of heat, motion, and force into work, and the extent to which such mining appliances are desirable in mining pursuits, where the capital to be expended is a known quantity.

For these and other considerations, therefore, the work is divided into two distinct parts; the first giving accurate drawings and descriptions of all the appliances now in successful operation at the various mines and mills on the Comstock. Among the chief features of this division will be large, double-plate atlas drawings of the principal hoisting-works, such as the Forman shaft, Yellow Jacket hoisting-works, Chollar, Norcross, and Savage combination shaft, and the Mexican, Union, and Sierra Nevada shaft.

The various styles of wood-framing used for shafts, gallow-frames, and buildings will be included; also such minor appliances as the miner's pick and shovel, cars, cages, skeets, water or bailing tanks, chairs, sheaves, giraffes, and underground winze engines, as well as other appliances for underground hoisting, sinking, pumping, and ventilation.

The text will be liberally illustrated by page plates of all details requiring a larger scale than the general plates.

Nowhere in the mining world are there published records of pumping engines handling over 3,000 feet of vertical pump-rods and pumps, as can be seen daily at work at the Yellow Jacket shaft; while at the Mexican, Union, and California and Consolidated are to be found hoisting-engines whose piston speed is 1,400 feet per minute while extracting ore; a speed which, if ever equaled under like circumstances, has never been exceeded.

In the department of the reduction of ores, I shall present an exposition of the California battery and pan mills, giving full drawings of the machinery and framing as a whole, with details of all the important parts, such as mortars, cams, stamps, pans, settlers, agitators, quick-silver system, &c.

With these will be given cuts and descriptions of the machinery furnishing and developing the necessary power for driving the mill machinery.

The second part of the report, but first in importance in an engineering and mining point of view, will detail the result of my experimental determinations of the work accomplished by the various appliances in use, so far as it is possible to determine it.

These results, when discussed and arranged, will form a sound basis from which engineers and mining men may understand the limit of their expectations in the mechanical and practical accomplishment of the large mining undertakings. They will be able to foresee the results of proposed mechanical methods, without waiting for the results of unprofitable expenditure or wasted capital.

The result of careful scientific determinations of the comparative efficiency of the woods used in mines and hoisting works will be presented, both as burned under boilers in use and from a chemical determination of the composition of the fuels, so that comparative results of the value of experiments may be made, when desired, with the same machinery, in other parts of the world.

A very large number of indicator and chronograph cards have been taken from machines, the diagrams of which will be embodied in the work, showing the velocity, power, and efficiency of the pumping and hoisting machinery, and the quantities of fuel necessary to produce the various results of hoisting ore and pumping water from the lower levels by surface engines; also by the use of compressed air and steam in the pumps used in the inclines and winzes underground. The power and efficiency of the different air compressors and machines using compressed air has been and will be determined whenever possible, and the results relating thereto discussed and illustrated.

In order to carry on these experiments, and to eliminate, as far as possible, all errors of mechanism, the instruments, indicators, chronographs, thermometers, electrical apparatus, &c., used in these mechanical investigations have been contrived and constructed with great care by the most experienced mechanical instrument-makers in Europe and the United States.

Having thus combined in one volume the design, construction, use, and efficiency of the mechanical appliances for the mining and milling of the precious metals of the Comstock lode, I believe that the results accomplished by the present machinery, as set forth, will have laid the foundation and indicated by the severe tests of experimental science the proper road to be followed in the design and construction of machinery, and in the proper application of the laws of dynamics and thermodynamics, so that the point of maximum efficiency, to which all like appliances can be made to approach, may finally be reached.

Very respectfully, your obedient servant,

W. R. ECKART, *Civil Engineer.*

MINERAL STATISTICS.

Foremost among all nations in the production of the precious metals, ranking first in resources of petroleum, coal, and iron, and abundantly endowed with nearly every mineral substance demanded by the civilized arts and sciences, the United States has conspicuously failed to gather and publish systematic statistical knowledge of the yearly mineral productions.

With the present rapid growth of industrial enterprise, with the complete interdependence of the arts, the least possible contribution to be made by the Federal Government should be a lucid, correct report of the

production in each branch of mineral industry. Yet, legislators, economists, capitalists, and intelligent artisans are driven to scattered newspaper statements and the occasional disconnected publication of Federal and State governments for information which should be within the reach of all.

Important as a statistical and technical knowledge of crops is to the practice of agriculture and the disposition of its products, it is even more so in the department of mineral industry, since the mechanical arts in a multitude of instances depend on an artificial association of mineral productions from widely separated regions.

The accurate knowledge of the mineral resources of a given State by its manufacturers is not enough to foster successful industry. For the safe and profitable conduct of business, a knowledge of operations in other and the most distant States is often vitally necessary. For instance, the great iron industry of Michigan and Wisconsin depends largely on the utilization of its ores in distant States, in combination with ores of other States and the coal and flux of still others.

Silver ores, valueless from their rebellious nature at the mines which yield them, are transported into neighboring States, there mixed with others of differing chemical constituents, and profitably worked. Close the few quicksilver mines of California, and you close a greater number of gold mines in Georgia. Not to multiply illustrations, every master of the mechanical arts, every intelligent manufacturer, requires, either for the construction of his plant or the prosecution of his industry, a knowledge of the mineral resources not only of his immediate region, but of distant States.

It is estimated that the mere raw products of the mineral industries do not fall far short of four hundred millions of dollars annually, and it requires no gift of extraordinary foresight to reach the conclusion that a few years will bring the yield to a thousand millions.

Until Congress extends the field of the geological survey over the region east of the 100th meridian, this bureau will confine its own operations in the department of mineral statistics to the industries of the far west. For the present year, however, with the approval of the Secretary of the Interior, the geological survey has been intrusted by the Superintendent of the Census with the collecting of the statistics of the precious metals, iron, coal, petroleum, copper, lead, quicksilver, and zinc for the census. In order to conform to the requirements of laws governing the census and the survey, the Geological Director and several of the corps of geologists have been constituted special agents of the census, without pay from the census appropriation; and in addition to this small staff, experts, duly appointed by the Superintendent of the Census, have been detailed from the Census Bureau and ordered to report to the Geological Director.

By this combination of the forces afforded by the census with the survey, the director is able to make a thorough beginning, and will furnish the Census Bureau and Congress with a thorough exposition of the production of the metals, coal, and petroleum, the most important branches of the mineral industry. In this combined labor care has been exercised that only census employes should be detailed to work in the region east of the 100th meridian.

In the disposition of this force of experts, the region east of the 100th meridian has been placed under the charge of Prof. R. Pumpelly, who has personally directed the operation of gathering the statistics from his office at Newport, R. I., where he has remained in charge of the laboratory of the Geological Survey. The work in Montana, Dakota, Wyoming, Colorado, and New Mexico has been given to S. F. Emmons,

geologist-in-charge, to be directed from his office in Denver. To George F. Becker, geologist in charge, were allotted the States and Territories of California, Oregon, Washington, Idaho, Nevada, Utah, and Arizona.

In order to successfully conduct so complex an investigation as the production and economies of the mineral industry, an elaborate series of schedules were framed during the past winter and put in print.

The scope of these codes of inquiry has been not merely an accumulation of data as to the output by weight and value of the mineral products, but it involves a deep analysis into the methods and economies of the successive steps of the industry.

It is proposed to arrive at a close approximation to the capital embarked and the money value of the plant now in use, to trace the cost of each process, to present a review and discussion of wages, and to state correctly the consumption of labor, power, and material; or, in other words, to give the aggregate cost of the various productions.

The technical schedules which form the basis of this inquiry relate to the following subjects: Metallic mines, coal mines, petroleum, charcoal-burning, hydraulic gold mines, hydraulic ditches, ore-dressing works, amalgamating mills, stamp batteries, pan amalgamation, roasting furnaces in amalgamating works, alternate amalgamation and concentration of battery sands, alternate concentration and amalgamation of battery-sands, arrastras, smelting works, preliminary operations for the same, smelting in shaft furnaces, smelting in reverberatory furnaces, desilverization by zinc, Pattinsonizing, improving of lead, cupellation, quicksilver reduction in general, quicksilver reduction in furnaces, quicksilver reduction in retorts, and quicksilver condensers.

Beside this, over the eastern half of the United States, where the work is wholly conducted from the funds of the census, the following mineral substances of commercial value are being investigated with a view to present a full report of the statistics of production and the technical methods of obtaining the commercial products:

Apatite,	Buhrstones,
Asbestos,	Borax,
Arsenic,	Bismuth,
Antimony,	Chrome,
Cobalt,	Manganese,
Copper,	Mica,
Corundum and emery,	Molybdenum,
Cements (hydraulic),	Mercury,
Fluor spar,	Niter,
Feldspar (for potash),	Nickel,
Gold,	Peat,
Grahamite,	Quartz,
Graphite,	Roofing slates,
Gypsum and plaster,	Serpentine,
Grindstones, millstones, hone-	Slate,
stones (novaculite, &c.),	Silver,
Glass sand,	Slate pencils,
Green sand	Soapstone (steatite),
Infusorial earth,	Soda,
Iron ores,	Talc,
Iron pyrites,	Tin,
Kaolin,	Tungsten,
Lead,	Zinc.
Lithium,	

Upon each schedule is printed an extract from the census act of March

3, 1879, covering sections 14 and 15, and a notice that all the answers to the inquiries propounded by the schedule will be confidential as to each separate manufacturing or mining establishment.

The experts into whose hands the schedules have been placed for field work have been instructed to assure all producers of the confidential nature of the information given, so far as individual establishments are concerned. They are instructed to assure all mineral proprietors that the items of the schedules will only be used in preparing aggregates and averages for States, Territories, and counties, and for the discussion of purely technical results; but that in no case will such presentation of material be made as would expose the private business of any concern.

Under this assurance there have been almost no refusals to give the desired information. The schedules are being rapidly filled, and a mass of material is being accumulated which will enable the survey during the coming winter to produce a valuable statistical volume, which should furnish full and elaborate data for the discussion of nearly all the mechanical and technical stages of the processes which are employed in the industries of the metals.

While the schedules are, in general, amply full to cover all the essential details of the industries, the experts have been instructed to report any technical local peculiarities, and any interesting features in the geology or exploitation of mines; and all are required to return specimens, of a uniform size, of the ores and inclosing rocks of every mineral deposit visited. These specimens, carefully labeled, will amount to many thousands, and will form the most important economical feature yet added to the mineral department of the National Museum.

With the money and force at command, it is hardly to be expected that this first gathering of the statistics of the mineral industries should be either perfect or exhaustive, but enough results are now in hand to clearly prove that for general accuracy and for technical fullness the present investigation has never been approached. By the first of next January the full investigation will have closed, and it is hoped that the early spring will find the consolidated results ready for discussion and publication.

Beside the material to be furnished by the technical schedules, it is designed to present an account of the methods of discovery of precious metal deposits, the various legal aspects of their ownership, and a review of the chief features which characterize Western mining civilization.

The leading outlines of the various subsidiary industries which depend upon mining industry will be described; and, in general, the business methods by which mining towns grow up and are sustained.

The following is a list of the special experts employed in this joint labor of the two bureaus, with their assignment to the special agents in charge of the three territorial divisions into which the United States has been, for the convenience of this special work, divided.

List of census appointments.

No.	Name.	Occupation.	Date of appointment.	Remarks.
1	King, Clarence.....	Expert special agent.....	July 1, 1879	Promoted July 1, 1880. Resigned.
2	Willis, Baily.....	Special agent.....	July 10, 1879	
3	Leffingwell, Wm. H.....	Special agent.....	July 17, 1879	
4	Wheeler, O. D.....	Disbursing clerk.....	July 18, 1879	
5	Pumpelly, Raphael.....	Expert special agent.....	Sept. 2, 1879	
6	Blair, Andrew A.....	Disbursing agent.....	Sept. 2, 1879	
7	Hoffman, Chas. F.....	Special agent.....	Sept. 29, 1879	
8	Lord, Eliot.....	Special agent.....	Sept. 29, 1879	
9	Beckor, Geo. F.....	Special agent.....	Mar. 6, 1880	
10	Emmons, Saml. F.....	Special agent.....	Mar. 6, 1880	
11	Rogers, Alfred M.....	Special disbursing agent..	Mar. 27, 1880	

List of census appointments—Continued.

No.	Name.	Occupation.	Date of appointment.	Remarks.
12	Johnson, Chas. F.	Expert special agent.	Aug. 1, 1879	With Prof. Pumpelly. Resigned March 30, 1880. Promoted July 15, 1880. Promoted July 1, 1880.
13	Brooks, Thomas B.	Expert special agent.	Aug. 1, 1879	
14	Putnam, Bayard T.	Expert special agent.	Oct. 11, 1879	
15	Gooch, F. A.	Expert special agent.	Oct. 23, 1879	Promoted July 1, 1880.
16	McKinlay, Robt.	Expert special agent.	Sept. 10, 1879	
17	Fay, Geo. A.	Expert special agent.	Nov. 21, 1879	
18	Benton, E. R.	Expert special agent.	Feb. 27, 1880	Promoted July 1, 1880.
19	Chanvenet, Wm. M.	Expert special agent.	Oct. 23, 1879	
20	De Blois, N. James.	Clerk.	Jan. 7, 1880	
21	Kensett, Jas. W.	Clerk.	Mar. 2, 1880	Promoted July 1, 1880. Promoted July 1, 1880.
22	Smith, Chas. E.	Clerk.	Oct. 20, 1879	
23	Ohm, Herman.	Expert special agent.	Feb. 27, 1880	
24	Dawley, Wm. P.	Clerk.	Jan. 7, 1880	Promoted July 1, 1880. Promoted July 1, 1880.
25	Craig, James.	Janitor.	Oct. 20, 1879	
26	Alsop, Edward B.	Expert special agent.	May 24, 1880	
27	Smock, Jno. C.	Expert special agent.	May 24, 1880	
28	Hall, L. B.	Expert special agent.	June 2, 1880	
29	Allen, Chas.	Expert special agent.	June 2, 1880	
30	Fellows, W. A.	Expert special agent.	June 2, 1880	
31	Lander, Wm.	Expert special agent.	June 2, 1880	
32	Hotchkiss, Jed.	Expert special agent.	June 2, 1880	
33	Orton, Edward.	Expert special agent.	June 2, 1880	
34	Benson, Ira F.	Expert special agent.	June 2, 1880	
35	Potter, W. B.	Expert special agent.	June 2, 1880	
36	Chamberlain, T. C.	Expert special agent.	June 2, 1880	
37	Fulton, John.	Expert special agent.	June 2, 1880	
38	Little, George.	Expert special agent.	June 2, 1880	
39	Cantrell, Jas. G.	Expert special agent.	June 2, 1880	With Prof. Pumpelly
40	Proctor, Jno. R.	Expert special agent.	June 2, 1880	
41	Bennett, Ensign.	Expert special agent.	June 2, 1880	
42	Wilber, Francis A.	Expert special agent.	June 12, 1880	
43	Nicholson, Frank.	Expert special agent.	June 14, 1880	
44	McKee, David.	Expert special agent.	June 14, 1880	
45	Comstock, Wm. O.	Expert special agent.	June 14, 1880	
46	Harper, Jas. P.	Expert special agent.	June 15, 1880	
47	Gregg, John C.	Expert special agent.	June 15, 1880	
48	Halle, C. Jr.	Expert special agent.	June 18, 1880	
49	Wilson, Jas. Jr.	Expert special agent.	June 26, 1880	
50	Irving, Roland D.	Expert special agent.	July 3, 1880	
51	King, Chas. F.	Expert special agent.	July 12, 1880	
52	Finley, C. B.	Expert special agent.	July 13, 1880	
53	Day, Wm. C.	Expert special agent.	July 14, 1880	
54	Roy, Andrew.	Expert special agent.	July 13, 1880	
55	White, Jno. F.	Expert special agent.	July 13, 1880	
56	Eldredge, Geo. H.	Expert special agent.	July 15, 1880	
57	Dale, T. Nelson.	Expert special agent.	July 20, 1880	
58	Haller, Saml. F.	Expert special agent.	July 22, 1880	
59	Phillips, Henry A.	Expert special agent.	July 24, 1880	
60	Wilson, Jos. M.	Expert special agent.	Aug. 11, 1880	
61	Smith, Oscar E.	Clerk.	Aug. 13, 1880	
62	Shaler, N. S.	Expert special agent.	Aug. 18, 1880	
63	Campbell, A. C.	Expert special agent.	Aug. 30, 1880	With Mr. Emmons. Resigned July 31, 1880.
64	Potter, Charles.	Expert special agent.	May 31, 1880	
65	Harrison, R. B.	Expert special agent.	May 31, 1880	
66	Curtis, Jos. H.	Expert special agent.	May 31, 1880	
67	Cunningham, Jno. M.	Expert special agent.	May 31, 1880	
68	Hammond, Jno. H.	Expert special agent.	May 31, 1880	
69	Huntley, Dwight B.	Expert special agent.	May 31, 1880	With Mr. Becker.
70	Williams, Albert, Jr.	Expert special agent.	May 31, 1880	
71	Northhoff, Walter.	Expert special agent.	May 31, 1880	
72	Sharp, Wm.	Expert special agent.	May 31, 1880	With Mr. Emmons. With Mr. Becker. Resigned August 10, 1880.
73	Leavens, Henry W.	Expert special agent.	May 31, 1880	
74	Atkinson, Stephen E.	Expert special agent.	June 23, 1880	
75	Schaeffle, E. H.	Expert special agent.	June 23, 1880	With Mr. Emmons.
76	Fisher, Wm. B.	Expert special agent.	June 30, 1880	
77	Noyes, Theodore W.	Expert special agent.	July 13, 1880	
78	Herdman, John E.	Expert special agent.	July 13, 1880	With Prof. Pumpelly.
79	Fawcett, W. L.	Expert special agent.	July 14, 1880	
80	Brown, Jos. G.	Expert special agent.	July 15, 1880	
81	Foster, Wm.	Expert special agent.	July 24, 1880	With Mr. Emmons.
82	MacArthur, G. F.	Expert special agent.	July 30, 1880	
83	Wilson, Chas. F.	Expert special agent.	Aug. 3, 1880	
84	Braden, Spruille.	Expert special agent.	Aug. 3, 1880	
85	Paul, A. R., Jr.	Expert special agent.	Aug. 16, 1880	
86	Holland, Wm. A.	Expert special agent.	Aug. 16, 1880	
87	Shrader, M. D.	Expert special agent.	Aug. 16, 1880	Experts for special statistics under direction of Elliot Lord.
88	O'Connell, Daniel A.	Expert special agent.	Aug. 16, 1880	
89	Walton, Chas. S.	Expert special agent.	Aug. 16, 1880	
90	Thompson, Percy.	Expert special agent.	Aug. 16, 1880	

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF MINING GEOLOGY,
Newport, R. I., September 10, 1880.

Hon. CLARENCE KING,

Director United States Geological Survey, Washington, D. C. :

SIR: Immediately after my appointment in July of last year, I proceeded to organize the work of the division intrusted to my charge, both for the work of the survey (proper) and for the collection of the statistics of mines and mining east of the Mississippi River.

Owing to the necessity of doing continuous work for the whole year for the census, Newport was selected as a point at which the work could be carried on without the necessity of long summer vacations, and the fact that there already existed at that point several government offices.

I was instructed to gather the statistics of the non-precious metals and of coal.

For this purpose the organization of the personnel was made after much careful consultation with the best-informed people in the different States. In some States it was found desirable to select our agents from the State geological surveys; in other States among the corps of inspectors of mines or mining engineers, and in all cases taking those persons who were represented by trustworthy authority as being the best fitted for the purpose; and the results have proved the wisdom of the selection. The agents thus appointed, and their assistants, hold office only during the time necessary to complete the statistical work of the mining regions assigned to them.

The organization of this part of our corps is the following:

Name.	State.	Appointment applied for.	Salary.
Edward B. Alsop	Pennsylvania	May 21	\$5 00 per diem.
Prof. Jno. C. Smock	New Jersey	May 21	5 00 per diem.
Ensign Bennett	Indiana	May 25	5 00 per diem.
Prof. Edward Orton	Ohio	May 25	6 00 per diem.
Prof. W. B. Potter	Missouri	May 25	5 00 per diem.
Prof. T. C. Chamberlin	Wisconsin	May 25	5 00 per diem.
John Fulton	Pennsylvania	May 25	5 00 per diem.
W. A. Fellows	Pennsylvania	May 25	4 00 per diem.
Chas. Allen	Pennsylvania	May 25	5 00 per diem.
L. B. Hall	Maryland	May 25	5 00 per diem.
Jed Hotchkiss	Virginia	May 25	5 00 per diem.
W. C. Kerr	North Carolina	May 25	5 00 per diem.
Dr. Geo. Little	Georgia	May 25	5 00 per diem.
Prof. Eugene A. Smith	Alabama	May 25	5 00 per diem.
James G. Cantrell	Tennessee	May 25	5 00 per diem.
Jno. R. Procter	Kentucky	May 25	5 00 per diem.
Prof. A. G. Wetherby	Ohio	June 7	4 00 per diem.
Prof. N. W. Lord	Ohio	June 7	2 00 per diem.
Edward Hyatt	Ohio	June 7	2 00 per diem.
Edward Orton, jr.	Ohio	June 7	2 00 per diem.
Francis A. Wilber	New Jersey	June 10	4 00 per diem.
David McKee	Missouri	June 12	3 00 per diem.
Wm. O. Comstock	Missouri	June 12	3 00 per diem.
Frank Nicholson	Missouri	June 12	3 00 per diem.
James P. Harper	Indiana	June 12	4 00 per diem.
John C. Gregg	Indiana	June 12	4 00 per diem.
C. Halle, jr.	Virginia	June 17	1 00 per diem.
James Wilson, jr.	Wisconsin	June 23	4 00 per diem.
Prof. Roland D. Irving	Wisconsin	June 28	6 00 per diem.
Andrew Roy	Ohio	July 2	4 00 per diem.
C. B. Finley	Pennsylvania	July 10	5 00 per diem.
Wm. C. Day	Maryland	July 10	3 00 per diem.
Henry A. Phillips	Pennsylvania	July 21	2 50 per diem.
Sam'l M. Haller	Maryland	July 20	3 00 per diem.
Geo. H. Eldridge	Massachusetts	July 14	90 00 per mo.
A. C. Campbell	Tennessee	Aug. 2	4 00 per diem.
N. S. Shaler	Massachusetts	Aug. 15	5 00 per diem.
Jos. M. Wilson	Massachusetts	Aug. 9	4 00 per diem.
Wm. L. Fawcett	Illinois	July 12	5 00 per diem.

For the purpose of gathering these statistics, we have adopted separate schedules for each of the mining industries, containing questions covering the total product of the production of the mine during the census year; its value, amount of invested capital, the consumption of labor, materials and power used in obtaining the product, and a large number of questions intended to throw light on the methods employed in

the industry; and upon the condition of these industries as to mechanical contrivances; and upon the social and vital statistics of the mining communities. Besides these there are numerous questions which are to furnish material for discussions of the subjects which come properly under the province of this office. Our schedules contain also questions gathered for the benefit of the agents in charge of fire insurance, life insurance, and of forestry.

Among the special lines of inquiry which we are following is the study of the dynamic statistics in the mining industry, which I have intrusted to Mr. Charles F. Johnson.

These documents were distributed as prior schedules by the agents among the mines in each State. These, when returned properly filled in, were forwarded by the agents directed to this office. When incorrect, they were returned to the mine, and after lapse of a sufficient time the whole State was traversed by the agents to fill in the schedules at the delinquent mines, and this has been found necessary in a large majority of cases.

The work of gathering the statistics proper is fast approaching completion; the principal States—Ohio, Indiana, Pennsylvania, &c.—having only a few counties to hear from.

Besides the schedules, the agents are supplied with note-books containing questions relating to the general industry, and to the social and vital statistics of mining communities; these note-books will be filled out by those best informed in each district, and will be used as aids in the discussion of the statistics.

As the schedules arrive at this office, they are tabulated in full, and a register will be opened to record every mine and locality of mining industry in the country; this will form the basis for the mineral register that is to be a feature of the Geological Survey.

One of the objects of transferring the gathering of the statistics of mines from the ordinary enumerators to the Geological Survey was the possibility of thus having them gathered and discussed by experts; for this purpose each mining industry will be studied as to the distribution of the raw material, whether developed or not, and statistically as to the condition of its development during the census year, and in its relations to other industries.

In this investigation it was thought best to concentrate our energies upon a study of the iron ores of the country, as being the direction in which we could be of the greatest service.

The rapid development of iron manufacture during the past ten years called into existence a vast number of mines producing ores of the most varied characters.

While many of the older of these are mentioned in the reports of the various State geological surveys, by far the greater number are known only to local consumers.

The great revolution caused in the iron manufacture by the new steel making processes has rendered the knowledge of the chemical composition of the iron ores one of the very greatest importance.

And while the character of the ores of each group of mines was known to one or two consumers, there was no way by which this knowledge could be made useful to the whole manufacturing industry.

The importance to the whole country of an accurate study of this subject, and of the wide-spread diffusion of the results obtained, is the justification of the extensive investigation which has been taken in this direction.

It was decided to make an exhaustive chemical study of all the iron ores in the United States.

The chemistry of this work was intrusted to Mr. Andrew A. Blair, formerly in the Missouri geological survey (as chemist for the iron ores), and later in the very important board appointed to test iron, steel, and other metals.

To obtain the material for this study, it was necessary that every mine, or group of mines, should be visited by an expert, and this work was intrusted to four members of the survey—Mr. Bayard T. Putnam, Mr. Bailey Willis, Mr. William M. Chauvenet, and Mr. E. R. Benton.

At each mine, the ore, as prepared for market, was sampled in a uniform manner, by taking many hundreds or thousands of chippings to insure an average sample. Wherever the mine contained varieties of ore sufficiently abundant to justify their separation, if desirable, into different classes, each variety was sampled separately, to show its influence upon the chemical character of the whole output.

The sampler entered in his special note-book a record of each sample, showing its locality, its position in the mine, and, where desirable, a sketch of the mine, and the relation of the mine to routes of transportation, and such other information as may be of interest in connection with the sample taken.

The samples have their full history and significance thus recorded in these note-books. They are then forwarded by mail in franked packages to this office, where we are provided with every convenience for preparing them for analysis and for their chemical study.

The samples have already been collected in the States of Michigan, Wisconsin, Missouri, Kentucky, Tennessee, Alabama, Georgia, South Carolina, North Carolina, Virginia, New Jersey, and Eastern New York. While Ohio, Pennsylvania, West Virginia, Maryland, Western New York, and the few localities in the Northeastern States will soon be finished.

There have been thus gathered over one thousand samples, each weighing from ten to twenty pounds. Of each finely powdered sample there is retained a considerable amount for future reference, and should it be found, at any future time, that any substance exerts an influence now unsuspected upon the qualities of the iron or steel, it will be possible to easily determine that substance if present in all of our samples, and interpolate the result into the analysis now being made.

Full sets of these samples will be preserved in the office of the Survey, in the National Museum, and in the Museum of Natural History in New York.

Accompanying each sample, there are hand specimens illustrating each variety represented in the sample, and, independently of these, triplicate sets of specimens of these have been collected, illustrating the ores and the associated rocks in each mining district for the collection in the National Museum. Besides the chemical study of the ores, there will be a microscopic study which will be extremely interesting, as it will be made parallel with the chemical study of the same samples.

We have already about fifteen hundred specimens illustrating the samples and the triplicate set of ores and rocks for the National Museum.

In the work of the Geological Survey (proper), Professor Roland D. Irving has been employed in tracing a continuation of the copper-bearing rocks of Michigan and Wisconsin through Northeast Minnesota to the British boundary. This formation, which produces so large a proportion of the world's product of copper, has been studied on the American side, both by the Michigan and Wisconsin geological surveys, and on the north shore by the geological survey of Canada.

It was thought very desirable to trace this formation through the little-studied region of Minnesota to a point where the results obtained by the American geological surveys could be compared intelligently with those of the Canada survey.

Another party is studying the distribution of iron ore in Northern Minnesota; and during the autumn of 1879, and the succeeding winter, a party was employed in making the necessary geological and magnetic observations to trace the connection between the iron-bearing formations of the Marquette district in Michigan and the new iron fields on the Menominee River, and also in tracing, by means of the magnetometer, the continuation of the Menominee iron-ore range eastward, under the overlying strata of the Silurian sandstones and limestones.

Very respectfully, your obedient servant,

RAPHAEL PUMPELLE,
Geologist in Charge.

UNITED STATES GEOLOGICAL SURVEY,
DIVISION OF THE ROCKY MOUNTAINS,
Denver, Colo., October 10, 1880.

HON. CLARENCE KING,

Director United States Geological Survey, Washington, D. C. :

SIR: I have the honor to present the following report of the census work under my charge during the current year.

On assuming charge of this division of the United States Geological Survey, the following formed part of the instructions transmitted to me by you for the conduct of my work:

"Personally you will confine your investigations, till further orders, to the metallic minerals of Colorado, their geological connection, mode of occurrence and association. District by district you will acquaint yourself with the minutest features of lodes, with the legal aspect of mining, and you will prepare to furnish for the year 1880 such statistical tables as may be necessary to show, as far as practicable, the gross and net product of each mine, district, and region, summing up in one general table the entire precious-metal product of Colorado. As far as possible you will check mine, mill, and furnace returns by the receipts of the various transportation companies, and in general trace the metal into actual market. In the case of base bullion, refining returns should be obtained if the process is completed in America; if not, note to that effect should be made."

For various reasons, but little had been accomplished in collecting the statistical information indicated above, when, being summoned by you to Washington, in January of the current year, together with Mr. Becker, you informed us that, having assumed charge of the collection of mining statistics for the Tenth Census, under General F. A. Walker, over the entire region west of the Missouri, you should place the practical direction and management of this collection in the hands of Mr. Becker and myself for the States and Territories included in our respective divisions, and directed

as to prepare a system for obtaining the desired information, by means of suitable schedules, which should be filled out by trained experts and supplemented by their personal observation. Your instructions as to the information to be collected were that not only should full and accurate figures be obtained of the production during the year ending June 1, 1880, of all mines, smelting works, stamp mills, concentration and lixiviation works, quarries, and, in short, all natural sources of mineral wealth, by district, county, and State or Territory, with the necessary checks which would be afforded by the returns of mints, United States assay offices, banks, and transportation companies, but that at the same time material should be collected for making a report upon the geographical and geological distribution of ores; the more or less favorable conditions of each district as regards the costs of labor, supplies, and transportation to market; for working the same; the various systems employed in mining and smelting, and their advantages and disadvantages; the average costs of production, and average profits obtained; the workings of the present laws upon mining; the causes of litigation; in short, upon any point that would be of direct or indirect practical value to the mining industry of the country, or to science in general.

In obedience to these instructions, the schedules were prepared, each containing a series of questions, whose answers should give most complete and exhaustive information in regard to each individual mine or works, the questions arranged in each case in a given order, under the general heads: Position, ownership, geology, development, system of working, accidents, plant, consumption of labor, power and material, production, disposition of product.

The number of questions in each schedule, included under these different heads, reached one hundred and fifty, in some cases varying with the character of the works to be examined. Printed schedules were prepared for each of the following:

1. Metallic mines.
2. Coal mines.
3. Petroleum wells.
4. Charcoal burning.
5. Hydraulic mines.
6. Hydraulic ditches.
7. Ore dressing and concentration works.
8. Amalgamation mills, in general.
9. Stamp batteries.
10. Pan amalgamation.
11. Roasting furnaces in amalgamation works.
12. Alternate amalgamation and concentration.
13. Alternate concentration and amalgamation.
14. Arrastras.
15. Smelting works in general.
16. Preliminary smelting operations.
17. Smelting in shaft furnaces.
18. Smelting in reverberatory furnaces.
19. Desilverization by zinc.
20. Pattinsonizing.
21. Improving of lead.
22. Cupellation.
23. Quicksilver reduction in general.
24. Quicksilver reduction in retorts.
25. Quicksilver reduction in furnaces.
26. Quicksilver reduction in condensers.

Printed instructions were also prepared for the experts to be employed, which contained as well directions concerning the manner of conducting their investigations, keeping their government accounts, &c., as in regard to the manner of preparing schedules for special work or industries not included above, such as salines, limekilns, brick-yards, and, in short, any production of mineral matter obtained directly from the earth and not manufactured. They were also instructed to obtain from each mine specimens of the ore (average quality), gangue and country rock on the hanging and foot walls of the vein or deposit respectively; and to obtain full and accurate copies of all State and district mining laws and regulations, when such were in existence.

Printed circulars were likewise prepared to be sent to all postmasters, mine recorders, and express agents, with blanks and addressed envelopes inclosed, requesting them to send to the office a list of all mines, mills, smelting works, &c., in their respective districts.

The necessary machinery of the investigation having been prepared, suitable persons were sought to fill the position of experts, the requirements for which position involved not only a technical education which should enable them to understand the theory of the various processes and systems examined, but also a practical experience

and residence of some duration in the mining regions, and actual work among mines and smelters.

The limits of my division including the Territories of Montana, Dakota, Wyoming, and New Mexico, and the State of Colorado, it was at first considered that one expert to each would be sufficient. I afterwards found it would be necessary to have a special expert for the mines and works of Leadville and its vicinity; and later, additional experts have been temporarily engaged, in order to secure the completion of the work before the winter snows, which promised to be unusually early this season, should close the approaches to the many mines in this district which are situated at altitudes of ten thousand feet and over.

I was fortunate in securing the services of Messrs. W. G. Sharp, Charles Potter, E. H. Schaeffle, W. B. Fisher, William Foster, and J. E. Hardman, to whom were later added Messrs. J. G. Brown, T. W. Noyes, G. P. McArthur, C. F. Wilson, and Herman Garlich. Mr. R. B. Harrison, superintendent of the United States mint at Montana, volunteered quite early in the season to assume charge of the district of Montana, but had commenced only a few weeks when, for some as yet unexplained reason, he sent in his resignation, thus causing the loss of nearly a month's time ere the position could be filled and his substitute arrive at the field of work. With this single exception, the work has progressed without any serious obstacles, and all the gentlemen associated with me have shown great intelligence, patience, and perseverance in an occupation which tries these qualities to the utmost. The actual business of collecting the desired information was commenced as soon after June 1, 1880, the close of the statistical year, as circumstances would permit. The country had been divided up into districts as nearly equal in extent of work as the preliminary information obtained through our circulars would enable us to make. Under this division, one expert was assigned to Montana, one to the Black Hills and Wyoming, one to Northern, Central, and Southern Colorado, respectively, and one to New Mexico; additional experts being assigned to different regions as the progress of the work showed the need of them. Some of the gentlemen employed have already finished the work assigned to them, others will have completed their labors very shortly, and before the close of the calendar year all will have been released from their labors, and the material collected securely lodged in our safe, connected with the Denver office, ready for tabulating and deducing the various interesting generalizations we expect to obtain.

The results of our work thus far are in general favorable beyond our expectations. In carrying on investigations which from the necessities of the case are somewhat inquisitorial in their nature, we anticipated a great deal of reluctance on the part of owners and superintendents in answering our numerous questions, many of which at first glance might not seem pertinent to the simple gathering of statistics of production. In the large majority of cases, however, not only has the desired information been most freely given, but often volunteer assistance to the extent of individual power or means has been freely proffered to the experts in carrying out their investigations. Naturally this has been the case with the more intelligent portion of the mining community, who readily see that a few moments' or even hours' time taken from their business is not thrown away when it contributes to the success of a work which will enable them at a glance to see truly the varied conditions of mining industry in different sections of the country. In one or two cases, persons have been found who questioned the right of government to inquire into their private business, as they expressed it, forgetting that the wealth they are drawing from the earth is practically a free gift to them from that government, and that the work is undertaken not for the personal amusement of those who conduct it, but for the benefit of the class to which they belong. More frequently difficulty has been experienced in the case of those with whom the press of business was such that they could hardly give the necessary time to our experts; more especially has this been the case in Leadville. They should, however, not forget that a definite engagement made with an officer of the census ought to be as binding as any other business engagement, and that by not keeping it they are the cause of much unnecessary expense and delay to the work. On the other hand, the number of producing mines bids fair to fall very much below the number estimated by means of our returns from postmasters, &c., who, with the prevailing local pride, doubtless included as producing mines a very large number which would not strictly come under that head. It is as yet too early to estimate the number of mines, &c., from which returns will have been obtained, for although the time of actual field work is already well advanced, many schedules are still in the hands of experts, wanting some partial data for their final completion, and no small number in transit. The total number of completely filled out schedules returned to this office amounts to about 400, and an equal number of specimens representing the geological and mineralogical characteristics of mines examined are in our case ready for study and determination. Still more useless would it be at this time to try to give any estimate of the total annual production of the precious metals of the region under examination, since until absolutely all the schedules have been received, and the returns carefully compiled, any such estimate would amount to little more than a rough

guess. The returns furnished by the schedules will, I find, have to be received with more or less distrust. The occupation of mining, its search after the unseen and unknown, its sudden and unlooked-for vicissitudes, the supposed importance of keeping up an excitement in order to attract capital, have in many cases so biased the moral sense of otherwise honest men that they seem to consider it a duty they owe to themselves and the community in which they live to exaggerate the production or value of any mining property in which they may be interested.

What obtains in this respect with the individual applies also to communities, and I have had occasion to know cases where published circulars of the daily or weekly output of certain camps (when, for some reason or other, not necessarily injurious in itself to the permanent value of the camp, there had been a serious falling off in the day's or week's production) had given, instead of the actual amount of ore or bullion produced, that of some more favorable week or day.

From this it will be seen that the figures obtained by us will be likely to differ from those compiled from such sources. We have numerous checks by which to rectify the production of smaller mines—the accounts of the banks and smelting works which buy the ore or bullion; those of the transportation companies through which it is shipped to market. The larger companies are generally conducted on good business principles, their books and accounts systematically kept, and the value of their product controlled by frequent assays, so that the returns given by them may be considered sufficiently reliable, but it is most astonishing to find, as I have, whole districts, relatively important producers, in which the mine owners in general keep no regular accounts, and have no assays made of their ore. They pay the mills so much for reducing their ore, and take the bullion returned by the mill, without any means of knowing what proportion of their product has gone down the stream in the form of sluices and tailings.

Mining, when properly conducted, is a legitimate and most profitable business, but to succeed in the long run it must be conducted on legitimate business principles. In the early days of mining in this country, when only the cream of the mineral deposits was skimmed off, their exceptional richness admitted of profits even when these principles were utterly neglected. But the establishment of mining as a permanent industry involves the treatment of low-grade ores and the investment of a considerable amount of capital.

Now, capital is essentially timid, and until it is practically proved that mining can be conducted as honestly and systematically as any other business, such as manufacturing or railroading, it will never flow in any steady stream into mining investments. One of the most important practical results to be hoped from our investigations will be the encouragement of capital to embark more freely in mining enterprises. Actual figures of production will be published for each district, county, and State or Territory, which will be free from bias or prejudice in favor of one region over another, or of suspicion of interested motives in making a good show for the industry generally. The condition of our Western mines is now in such a flourishing state that the most literal and conservative accuracy will make a sufficiently favorable showing, while the exaggeration which many are induced to indulge in tends to make the Eastern public incredulous of any statement which may be made, however truthful, if it comes from a source which may be suspected of being in the slightest degree interested.

Not only will the quantity and value of precious metals produced be given, but also the average cost of producing the same—the cost of labor, of provisions, of timber, of iron, steel, powder, and all the factors, respectively, which go to make up that cost; the position of each district with regard to lines of communication, its facilities for getting its product to market, &c., all very important items of information to the investor, for many mines which may produce rich ore are as yet practically worthless, because of its peculiar situation in respect to some important item entering into the cost of production, which renders it greater than the net price to be expected from the product. By means of the results obtained from our tables, we shall be enabled to criticise and compare the systems of working, or processes employed in various districts, and thus far-separated regions or newly-opened mines may be enabled to profit by the practical results obtained by their fellow-workers under similar conditions to their own, and get the benefit of their experience. In a scientific as well as practical direction, the geological data obtained and the specimens collected will be of inestimable value.

The latter will be carefully examined mineralogically, chemically, and microscopically, and with more or less exactness we shall be able to give the probable age of the different deposits, the average character of the ores of each district, the geographical distribution of each class of ore, and many practical suggestions to guide the prospector or miner in his search for the precious metals. The collection of ores thus obtained will be systematically arranged, and will form the nucleus of a collection of average ore specimens of all the known mines in the country, which it will require but little labor hereafter to complete from year to year, furnishing material for any future investigations, and affording a most valuable means of practical illustration of

the mineral wealth of different parts of the country. Data will be obtained in regard to the various employments connected with mining and its allied industries, upon the health of the workmen, as well as the prevailing accidents to which they are liable, and suggestions offered as to the means of preventing them. Comparisons will be instituted from the data obtained, as to the condition of the mining classes as contrasted with those engaged in other industrial pursuits, in reference to wages, average diet, the hardships which they undergo, and the advantages they enjoy.

Thus the workingman, as well as the capitalist, will derive benefit from our investigations, and if the practical results of our work are at all commensurate with the amount of labor involved in obtaining them, their value to the mining public generally should be very great.

Very respectfully, your obedient servant,

S. F. EMMONS, *Special Agent*.

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,
Virginia, Nev., October 10, 1880.

HON. CLARENCE KING,
Special Agent Census:

SIR: The collection of mining statistics has usually been confined, or nearly confined, to data respecting the production of ores and metals. The gross result of an industry, however, does not constitute its sole importance, nor is this the only point which can be investigated statistically. In mining, it is true, the main source of wealth is the earth itself, and the industry is, like agriculture, strictly productive. But mining cannot be prosecuted without drawing upon some industries for supplies, and in its turn furnishes others with raw material. This well-understood interdependence of human pursuits makes it desirable for the public at large that information should be collected concerning many other features of the mining industry besides its mere production. Such, for example, are, the position of the mines relatively to the lines of communication; rates of freight; sources whence the various supplies consumed are drawn; the points to which the products are distributed; and many more. For the sake of those directly interested in mining enterprises—a large and growing class—information of another kind is desirable, namely, a record of general methods of management and working as they have been developed in the various districts of our enormously extended mining region. It is the purpose of the present investigation to gather, sift, and collate all such facts, in such detail as seems likely to serve any general purpose.

The region west of the Rocky Mountains has been divided into seven districts, and in each of them a special expert is now at work. These gentlemen were carefully selected out of a large number, on evidence of their special fitness for the business in hand. Their names and the districts to which they have been assigned are as follows: Cunningham, J. M.—Washington, Oregon, and California east of Coast Range and north of Nevada County, California.

Curtis, J. S.—Nevada, south of Central Pacific Railroad, and California east of Sierras.

Hammond, J. H.—From the crest of the Sierras to the Sacramento and San Joaquin Rivers, from the north boundary of Nevada County south, and the Bodie district.

Huntley, D. B.—Utah.

Leavens, H. W.—The Coast Range, and interval between it and the Pacific shore.

Nordhoff, W.—Arizona.

Williams, A., jr.—Idaho, and Nevada north of the Central Pacific Railroad.

The limits of the districts were decided upon for the purpose of equalizing the labor in each as nearly as possible, and with a view to completing the inquiry within six months. In the mean time, of course, no general results can be given, but the character of the results anticipated can be foreshadowed.

At present no approximately complete list of the mines west of the Rocky Mountains exists, nor any accurate mining map. It is well known that the mines of this region lie in belts, conforming in direction to the numerous parallel ranges of mountains which stretch from north to south between the Pacific coast and the Wahsatch Range just east of the Great Salt Lake. The different mineralized belts carry different ores. Thus, the Coast Range of the Pacific carries coal, quicksilver, and some other less important minerals; a copper and iron belt lies at the west foot of the Sierra Nevada; the gold belt occupies the slope above the copper; just east of the Sierra Nevada comes a silver-bearing zone, the most important point of which is the Comstock lode; through Central Nevada and Arizona, in a less well-defined belt, occur many rich silver mines, in some of which lead is an important constituent, while in others it is absent; finally, extending through Utah, and just west of the Wahsatch Range, is a chain of argentiferous lead mines. The returns of the special experts will show the geographical position of each mine, and also its position relatively to the lines of communication. They will further enable us to trace out more in detail this

curious and important parallelism in the mineral belts. It is a well-established fact that these belts are directly connected with the geological formations of the several regions, and these are already known with great minuteness in some portions of the country, while of others our knowledge is scanty or wholly wanting. As it is a portion of the duty of the experts to make certain geological observations on the occurrence of ore bodies, and to collect specimens of the ore and ore-bearing rocks, our knowledge, both of the ore-bearing formations and of the occurrence of ores in these formations, will be greatly extended. The investigation will serve as a geological reconnaissance, and will further give a more practical bearing to the information obtained by former geological surveys.

The extent and character of the investments which have been made in mining are being elaborately investigated. It is well known that, especially in California, many mines are owned by foreign companies, and many more by non-resident individuals and associations. But the extent of such ownership can only be guessed at until the returns of the experts are complete. The extent of the plant, and its cost at the various mines, mills, and smelting works, will show some curious features. Building works in the remoter parts of this region involves enormous expenditures. On the other hand, many elaborate works have been erected on the mere hope of discovering ore, and been practically abandoned. In some cases valuable ore was subsequently discovered in the neighborhood, and the fortunate owners were able to secure excellent machinery and buildings for an insignificant fraction of their cost. Works are to be found in the Great Basin, the machinery of which has been paid for, perhaps, at a higher price than any of a similar kind in the world, and some which has been purchased for less than it would have brought as old iron in an industrial center. The opening up of the ground is as much an investment of capital as the erection of works. Taking into consideration the almost desperate physical conditions of most parts of the Great Basin, the mere numerical statements of the total length of the shafts and galleries in the various districts will call up a striking picture of invincible industry. The Great Basin is essentially a great sage-brush desert, where water is so scarce that men perish miserably of thirst every year, and in its southwestern portion it is also the hottest area on the western hemisphere; yet the linear extent of the mine galleries which have been excavated in this region during the past twenty years will probably fall little short of a thousand miles.

The methods pursued in mining, and the reduction of ores, and their cost, form a branch of the investigation, which will be of special interest to all who are directly or indirectly concerned in the industry. Three very important advances in the technology of mining and milling have been made in California and Nevada. These are, the improved stamp battery; the system of amalgamation in iron pans, and the handling of auriferous gravels by jets of water under a head of many hundred feet, the so-called "hydraulic washing." All of these subjects have been very ably handled in our mining literature, but improvements are made every year, and there exists at present no record of practice exceeding in extent the more or less incidental observations of a single engineer. Such details of construction, adjustment, and management as seem to have a direct bearing on the efficiency of these and other processes involved in mining, milling, smelting, &c., have therefore been carefully selected for investigation, and questions bearing upon them form a portion of the schedules. We shall know the method of timbering practiced in every mine in the country; the weight of a car of waste or ore; the weight and drop of every stamp; the details of the construction of every mortar; the method of directing of all hydraulic nozzles; the styles of riffles used in sluices; the pressure of blast in every furnace, and hundreds of other details, so selected as to give a sufficiently complete idea of the whole practice. A proper exposition of these matters, which can be made without in any way betraying confidential information, cannot fail to be of the greatest benefit to the mining community. It will promote more careful work in existing mines and mills, and facilitate an appropriate selection of machinery and methods in new enterprises.

The cost of working is being examined, not only from a monetary point of view, for this varies enormously with the geographical and geological position of the mines, but as well with reference to the consumption of labor, power, and material involved. The number of hours' work done in each establishment, the quantity of fuel burned in the production of power, and the quantities of a variety of supplies consumed, will be as accurately known to us as it is ascertainable from the books of the various owners. Of course, no details of any man's private business will be made public, but this material can readily be generalized in such a way as to give information as precise as the public has any right to. Accidents and their causes will be fully examined, and as these in several European countries form a regular topic of official investigation, very interesting comparisons can be made. It is inherent in the nature of the country and genius of the people, that less elaborate precautions against accidents should be taken here than in Europe. On the Comstock lode, too, there exists a danger nowhere else encountered, for there it is not uncommon for men to die of the mere heat of the mines. On the other hand, few, except enterprising, self-reliant,

and wide-awake men, venture into our mines, and it seems not improbable that this may prove a compensating safeguard.

The final destination of ore and metals produced west of the Rocky Mountains is very various. Ores are, of course, largely reduced on the spot, but some go to San Francisco for treatment, some to the Atlantic States, and some to Wales. With metals, the case is similar. Some is refined at the works where it is produced, some goes east, some west, and some to Europe for separation. The returns of the experts will give the production and disposition in all cases. The inquiries will further be supplemented by the other methods of investigation of which this subject is capable, the records of the transportation companies, the banks, the mints, and the custom-house.

If no definite results can be given until the investigation is finished, the returns now daily received give an assurance that when complete they will furnish the data for such a picture of the mineral industries of the far West as has been roughly outlined in the preceding paragraphs.

In addition to the general investigation of the mines west of the Rocky Mountains, which is limited chiefly to their operations during the census year, a special inquiry into the statistics of the Comstock lode is being prosecuted, under my supervision, by Mr. O. D. Wheeler, which will extend over the whole period since the opening of this famous deposit twenty years since. This inquiry will embrace subsidiary industries, as well as that of mining and reduction. Especially interesting is the fluming of timber and fuel from the high Sierras to the railroad and the Carson River. The system has been in use, I believe, for a very long time in the Scandinavian timber districts, but has been developed to an enormous extent in the Sierra Nevada. A trough, usually V-shaped, now resting on the ground, and again supported on high trestles, is built as nearly as possible on an even grade from the timber district to some convenient station on the railway. The trough or flume is supplied with water, and the timber or fuel thrown into it is floated along at a high speed, sometimes at the rate of over ten miles an hour, to its destination. Thus the saw-mills can be placed directly in or close to the forests, and no unnecessary carriage is involved. The transportation of the sawn timber by fluming, probably does not cost over nine cents per thousand feet per mile, a far smaller expense than would be involved in any other practicable method.

The water-works of Virginia City are very noteworthy. Potable water is found there only in very small quantities, and it became absolutely essential to the existence of the mines and town to bring water from a point in the Sierra Nevada, thirty miles away, at a cost of no less than \$2,200,000, a large sum to stake on the permanence of an ore deposit. A remarkable engineering feature of this work is that the water is carried past a ravine by a U tube, improperly called a siphon, of boiler-iron, the lowest point of which is 1,700 feet below its upper extremities. As Virginia is not a distributing point, the consumption of the town is very accurately measured by the supplies and material transported by the Virginia and Truckee Railroad, the way-bills of which have been digested, classified, and tabulated. In short, an effort is being made to obtain complete economical, technical, and social statistics of the Comstock lode, and the community to which it furnishes employment. This course is justified by its representative character and its intrinsic importance; for, during the last twenty years, it has been the most productive silver mine in the world, and has added \$325,000,000 to the world's supply of the precious metals.

I have the honor to be, sir, very respectfully, your obedient servant,

G. F. BECKER,
Special Agent Census.

FORTHCOMING PUBLICATIONS.

The organization of the survey immediately followed the date at which the first appropriation of \$100,000 became legally available, and as that fell in midsummer, only half the ordinary time which the seasons permit was left for field operations. At the close of the present summer, therefore, the scientific staff will have labored only one and a half field seasons—a very short time to bring their special works to completion.

Realizing very fully, however, the natural desire of Congress and the Administration to see actual results and apply the test of a critical examination to the fruits of the new bureau, I have called upon the members of the corps for an energy and intensity of labor which should not be greatly prolonged, and which affords no measure of the rate of progress on small appropriations hereafter. The gentlemen of the corps have re-

sponded with such cheerfulness and enthusiasm that I am able to promise, between the close of field-work this autumn and the opening of next spring's campaign, the completion of twelve volumes of practical and general geology and paleontology.

I give a brief and condensed foreshadowing of these memoirs.

MINING GEOLOGY.

GEOLOGY AND MINING INDUSTRY OF LEADVILLE, COLORADO. By S. F. Emmons, geologist-in-charge.

This work will consist of (a) A treatise upon the geology of a tract six miles square, embracing the chief mines of the Leadville district, discussing the geological and lithological disposition of the local formations in relation to the origin, nature, and extent of the ore deposits; (b) Elaborate topographical and geological maps in eight sheets, illustrating the areas surveyed and showing the special configuration of the surface, the occurrence of the rock formation, and the location of all mining openings on such a large scale as to serve as the basis for any future works of engineering for the exploration, connection, or deep drainage of the mines of the district; (c) A geological description of an area twenty miles square, including in its midst the six-mile block. The object of this division of the volume is to discuss and illustrate the general geology of the neighborhood in its relation to the larger dynamic history of this section of the Rocky Mountain chain. This is accompanied by (d) A topographical and geological map upon which the described features are delineated.

The report will further contain (e) a special and technical description of the ore deposits, presenting especially such facts as bear upon the genesis, mineralogical constitution, area, tonnage, valuation, and continuance of the ores themselves, the economies of their extraction; and (f) an account of the processes of metallurgical treatment, and the yield and value of the metals produced.

In short, this book will, as far as the brief time given for its production allows, present to the public the scientific and technical information upon the Leadville district which is most anxiously desired by miners and students of mining geology and economy.

GEOLOGY OF EUREKA MINING DISTRICT, NEVADA. By Arnold Hague, geologist-in-charge.

This memoir is one of two upon the district of Eureka, Nevada. Its scope is purely geological, and it logically precedes a second memoir, which will be a technical treatise on the nature, position, extent, metallurgy, and production of the Eureka mines.

This district ranks first among those producing silver-lead ores. For a period of fifteen years it has maintained an almost unvarying prosperity; and, as a geological occurrence, an instance of vigorous mining, and an example of silver-lead metallurgy on a large scale, well merits the thorough and exhaustive treatment which it is proposed here to give.

Mr. Hague's volume gives the result of a close geological survey of a tract of country twenty miles square, embracing all the mines of the district.

Its leading interests will lie in the treatment of three special subjects: first, the great series of paleozoic strata, whose enormous bulk and thickness make up the great body of the rocks of the neighborhood;

second, a series of dynamic events, which have broken this great body of paleozoic strata into individual blocks, and riven the beds with many fissures, some of which have given egress to repeated volcanic eruptions, while others have been the theater of vein action, and are now occupied by the precious metal deposits upon which the industries of the district are based; and, third, the nature of the volcanic series themselves, and their relations to the ore deposits.

This report is accompanied by an elaborate topographical map of the area of twenty miles square in grade curves, executed under the direction of Topographer F. A. Clark. Upon this foundation will be shown, in color, all the geological features of the district as delineated by Mr. Hague.

This map, like the detailed map covering the Leadville mines, is of sufficient accuracy as to serve for all future purposes of geological description or general mining study.

THE COPPER ROCKS OF LAKE SUPERIOR, AND THEIR CONTINUATION THROUGH MINNESOTA. By Prof. Rowland D. Irving.

This formation, which embraces a distinct geological series, has been for many years noteworthy as producing a large proportion of the world's annual output of copper.

The geological surveys of Michigan and Wisconsin have thrown much light upon the formation in their respective States; and the Canadian survey has identified the series within the Dominion of Canada.

This special work of Professor Irving has for its object the illustration of the passage of these rocks through Northeast Minnesota up to the British boundary.

It is of the utmost importance that every acre of the copper series should be known and located; and the report of Professor Irving will prove the existence of the series over a large area of comparatively new territory.

HISTORY OF THE COMSTOCK MINES. By Eliot Lord.

This volume forms one of a series of three devoted to the Comstock lode, incomparably the most valuable metal deposit known to modern times. It is impossible to embody in one report any account of the development of this great industry. Its history, its geology, and its mechanical industry have now expanded to such proportions that neither one volume nor one author is enough to cope with its abundant and rich materials.

Accordingly, I have laid out three volumes, all of which should be completed in time to present for publication before the opening of the field work next spring.

Mr. Lord's volume will describe the discovery of the Comstock lode, the great legal struggle for its ownership and possession, the singularly brilliant campaigns which the directors and owners of this wonderful deposit have made against the obstacles of nature for thirty years, in which brief period they have reached a depth only attained in Europe after three hundred years of unremitting toil.

The history of the Comstock is one of the most extraordinary exhibitions of American industrial activity which our varied enterprise affords; and this presentation of its characteristic features cannot fail to be of interest and benefit to all who, in the future of American mining, find themselves called upon to wrest from the earth its deep-hidden treasures.

This volume conducts the reader from the first discovery of the Comstock to the present day; and illustrates with great care the advance of mechanical skill and the peculiar economical features of the local labor question.

THE COMSTOCK LODGE. By George F. Becker, geologist-in-charge.

In his volume, Mr. Becker will discuss the character and distribution of the rocks of the Washoe district in their bearing upon the formation of the Comstock lode. The deep penetration of the present mine openings, and the long gallery of the Sutro Tunnel, have brought to view new formations, unsuspected by the earlier writers upon the Comstock; and much new light is thereby thrown upon the succession of volcanic outflows which form the material of the country rock, and upon the chain of dynamic events which have followed one another from middle geological time, and united to form the Comstock lode.

This portion of the memoir will be accompanied by a geological map, executed by Mr. Becker on the basis of the topographical survey of the district lately completed by Capt. George M. Wheeler, Corps of Engineers, and kindly furnished by him to the Geological Survey.

Following the general geological discussion will be presented a full account of the lode itself, its dynamic history, vein structure, the discussion and classification of its materials, the form and mineralogical character of the bonanzas, together with their yield of the precious metals; also, a detailed account of the remarkable downward increment of heat which distinguishes these mines from all others upon the globe, and which renders their future exploitation not only a problem of capital and mechanical skill, but of the power of the human organism to exist and labor in the presence of intense moist heat.

This division of the report will be accompanied by an elaborate atlas, showing all the mine workings, up to date, embracing over two hundred miles of subterranean shafts and levels; and by a series of sections and projections, illustrating all the important details of structure of the lode as a whole, and the ore bodies in particular.

The volume will also embrace the results of a competent physiological study of the effect of the great heat upon the systems of the workmen.

MECHANICAL APPLIANCES USED IN MINING AND MILLING ON THE COMSTOCK LODGE.
By W. R. Eckart, C. E.

The magnitude, complexity, and efficiency of the mechanical appliances in use at Washoe have kept pace with the rapid development of the mining industry, until, at the present day, the more important machines are of great mechanical interest.

It is designed in this volume to present descriptions and discussions of the form and construction of the more important machines and appliances, illustrating them with elaborate working drawings, not only of the machines as put together and in use, but of all the more important detailed parts.

The volume will also present a mechanical and mathematical discussion of their actual and relative efficiencies based upon the consumption of fuels whose calorific powers are scientifically determined and accurately related to the question of cost.

COAL OF THE UNITED STATES. By Raphael Pumpelly, geologist-in-charge.

This volume will convey a statistical review of the present production of coal from all the coal-fields of the Union.

It will present a classification of the different coal-fields, an account of the character and thickness of all beds now worked, a tabular statement of the output, with the consumption of capital, labor, power, and material used in the annual production.

It will further detail the character of the more important plant, and illustrate the different systems of labor utilized in the industry. From

Seattle to Alabama, from Rhode Island to New Mexico, every considerable coal mine now in operation will have been visited and technically examined, and this extensive labor will have been wholly executed from the funds of the Census, and by experts of the Census, both of which have been furnished by General F. A. Walker.

The scope and character of the inquiry, together with all the elaborate, technical schedules necessary for the proper conduct of the investigation, have been devised, directed, and will be finally discussed by Prof. Raphael Pumpelly, of the Geological Survey.

IRON IN THE UNITED STATES. By Raphael Pumpelly, geologist-in-charge.

This work, another joint labor of the Census and the Geological Survey, has been executed by Professor Pumpelly from the funds and by means of the experts of the Census.

As in the case of coal, all technical preparations for the study, the laboratory, with its enormous amount of chemical investigation, and the entire direction of the work, have been furnished by the Geological Survey.

Professor Pumpelly will not only give the statistics of production, but will show the distribution of the great iron fields, and their relation to transportation, fuel, and market. He has furthermore added an investigation of the utmost technical interest to the whole industry, namely, an elaborate chemical survey of the great iron fields, showing, in the main, the distribution of iron and its association with the various chemical accompaniments, both those which are of advantage and those which are deleterious.

This chemical survey of the iron fields will afford a large view of the special distribution of each chemical type of iron ore.

As in the case of coal, the memoir will contain an account of the capital, labor, power, and material consumed by the industry during the census year, and numerous tabulations of technical points of value to those engaged in the iron industry, as well as to all students of American political economy.

THE PRECIOUS METALS. By Clarence King, director.

Division 1 of this volume is devoted to the discovery of the precious metals in the every-day current prosecution of the industry.

It will endeavor to fully illustrate the manner in which the precious metals, veins, and deposits are now discovered in the great West, embracing an estimate of the number of prospectors engaged in this singular pursuit, their mode of life, nationality, habits, migrations, and discoveries.

It will embrace a tabular statement of the number of mines officially located during the past year.

Division 2 will describe and explain the legal steps which constitute the ownership of claims from their discovery up to the time when they became operated mines. The number of conveyances of precious metal claims by deed in the whole United States will be shown; the laws, Federal, State, and Territorial, under which these ownerships obtain, will be cited and commented upon; and an historical sketch will show the origin of the local laws and customs which have sprung up spontaneously throughout all the western mining region, and which, by a process of change and evolution, have given rise to the present controlling Federal legislation.

In addition to these tables will be given showing the number of mines owned and worked privately, the number held in corporate ownership,

with the corporations localized in different States and Territories, and finally, a discussion of the system of mining corporations in relation to corporation laws and stock-board regulations, wherever American mines are owned, including France, England, and Holland.

Division 3 will consist of the results of a technical examination of the precious-metal mines of the United States (gold, silver, and quicksilver), which will embrace a statement of actual production for the year, localized by States and Territories, and full, technical statements of the characteristics of the industries, showing by elaborate tables the consumption of capital, labor, power, and material.

Division 4 will consist of a statistical and politico-economical study of the general aspect of the mining industry, its relation to locality and population, the civic institutions and business methods which have grown up in mining communities, and the legal and financial machinery by which this singular business is conducted. In the technical portion the director is aided by S. F. Emmons and G. F. Becker, of the survey staff, and in the department of political economy by Eliot Lord.

LESSER METALS AND GENERAL MINERAL RESOURCES. By Raphael Pumpelly.

This work, like the memoirs on coal, iron, and the precious metals, is made from the funds of the Census under the conduct of the Geological Survey.

The report will contain statistical statements of the production of the lesser metals—lead, copper, zinc, bismuth, chromium, cobalt, nickel—together with a partial review of the production of the following substances: Apatite, asbestos, arsenic, antimony, buhrstones, borax, bismuth, chrome, cobalt, copper, corundum and emery, cements (hydraulic), fluor-spar, feldspar (for potash), grahamite, graphite, gypsum and plaster, grindstones, millstones, honestones (novaculite, &c.), glass sand, green sand, infusorial earth, iron ores, iron pyrites, kaolin, lead, lithium, manganese, mica, molybdenum, mercury, niter, nickel, peat, quartz, roofing-slates, serpentine, slate, slate pencils, soapstone (steatite), soda, talc, tin, tungsten, &c.

The above four volumes, joint works of the Census and the Geological Survey, together with statistics of petroleum to be furnished us by General Walker, will enable us to present the first general summary of the leading mineral productions of the United States.

Owing to the insufficiency of money and means, and the enormous multiplicity of industries and wide extent of territory, it has been impossible to make an exhaustive survey of some of the really important substances, such as clay, building-stones, fire-clay, hydraulic cement, salt, alkalies, borax, &c.

It is intended that the statistical portions of these four volumes shall be combined in one volume on the mineral resources of the United States, which shall form the first of an annual series to be brought out by the Geological Survey.

It will be seen by the above notes of forthcoming volumes that a very large proportion of the labors of the survey has been given to purely economical questions. The Director felt that, with the mineral industries in their present hopeful condition, and in view of the wide-spread ignorance of the magnitude, importance, and technical facts of these industries, it was his duty to bend the energies of his bureau first of all to the production of immediate results of strictly practical value.

A very small proportion, therefore, of the funds and force at his disposal have been diverted into the department of pure geology. Three volumes, however, are forthcoming.

UINKARET PLATEAU. By Capt. C. E. Dutton, Ordnance Corps, geologist-in charge.

A very large amount of geological work, of which some interesting portions were nearing completion, have been inherited by this bureau from the geological survey lately under charge of Maj. J. W. Powell.

Of these, the district of the Uinkaret Plateau, bordering the great cañon of the Colorado, forms one of the most interesting parts. Capt. C. E. Dutton, of the Ordnance Corps, having been placed in charge of the division of the Colorado, is bringing to a close his geological examination of this peculiar district.

His report, accompanied by topographical and geological sheets, and illustrated by geological views from the pencil of Mr. Holmes, cannot fail to be an important contribution to our geological knowledge of one of the most striking features of the earth's crust.

LAKE BONNEVILLE. By G. K. Gilbert, geologist-in-charge.

It has been well known to the geological world for several years, through the writings of Mr. Gilbert and of the Director of the survey, that the basin of Utah is the bed of a great extinct lake, whose existence is as clearly proven as that of any of the existing seas.

This remarkable sheet of water existed in the glacial age, immediately preceding the present geological period. Its area was fully equal to that of Lake Huron.

Unlike the other extinguished oceans of the past, whose existence has been caused by the upheaval of the earth's crust, this lake has vanished from purely climatic causes.

It has simply dried up, leaving a few residuary lakes, of which Great Salt Lake is the chief. In the process of desiccation it has left a wonderful record of climatic oscillations and variations.

The desert climate of Utah and Nevada is one of the interesting physical features of the United States, and the oscillations of the moisture of this climate through periods of years since the occupation of these Territories by American emigrants have given rise to eager speculation.

Is the desert growing still drier or is it gaining in moisture are questions upon the lips of every intelligent settler in that region.

The volume of Mr. Gilbert will show the character and magnitude of those past climatic oscillations which have changed the aspect of the basin of Utah from a well-watered and green area to a country wholly desert, except when reclaimed by the enterprise of man.

Mr. Gilbert's volume is illustrated by topographical maps of the extinct lake, and numerous maps and diagrams showing the geological action of the receding waters.

DINOCERATA. A monograph on an extinct order of Ungulates. By Prof. O. C. Marsh, paleontologist.

This volume is a detailed monograph, illustrated by fifty-five quarto plates.

Among the recent geological discoveries in the Western Territories none is more remarkable than the bringing to light of enormous amounts of the remains of extinct animals.

The great collections of Cuvier from the Paris basin are already eclipsed by the immense yield of fossil bones from the tertiary and cretaceous strata of the far West.

This volume embraces a complete exposition of a new zoological order peculiar to America, and possesses high scientific importance as a contribution in the field of American paleontology.

FUTURE OF THE SURVEY.

In the history of the United States—whatever may be the political or social result of this century, whatever may be the final adjustment of the machinery of national government—upon one great field of American activity, the pride of to-day and the judgment of the future will agree. That field is the development of our material resources. In the industrial conquest of a continent the tide of victory has never ebbed.

In possessing ourselves of this broad, virgin area we have shown a power, unprecedented in the slower past, to discern, to seize, and to utilize the national wealth with which the United States is so liberally endowed.

With an energy never relaxed, with an originality which has revolutionized and improved nearly all industrial methods, we grasp the problem of material development, and grasping, solve it. Just as is the pride of all Americans in this signal achievement, every intelligent student of the country knows that we are yet at the very threshold of the industrial life of the Republic. We have only begun; we have the great work still before us.

The modern method of distributing population by means of that network of railroads, which is rapidly threading the last remaining wilderness, greatly accelerates the progress of the industries. There are no longer blanks on our maps marked "unexplored," nor are there untrodden fields for the pathfinder. The epoch of the pioneer is practically passed. Our fifty millions will equalize its grasp on the different sections by rapid migration till the population finds an equilibrium with the local resources. That equilibrium will soon be attained. Our real industrial problem is, then, to utilize with the highest technical skill and with the utmost scientific economy all elements of national wealth.

As a general proposition, it is true that the practical genius of the people, acting in the political and social freedom peculiar to our system of government, is enough to insure the success of our industrial efforts. At the same time, the government which grants and secures this freedom of action, has the power, and, I hope to show, the duty to bestow one sort of aid which can come from no other hand.

The great extent of the United States and the widely separated sources of the national resources render the acquisition by private citizens of information on almost any single product always difficult, often impossible.

As a direct result of the size of the country, the government and people have long been uninformed as to our primary industries; those, I mean, which yield the raw materials—mineral, vegetable, and animal.

To the Agricultural Department we owe the first reforms from this condition of wide-spread ignorance. In the realm of mineral productions the only efforts made to acquire any positive knowledge have been the highly useful, but feebly endowed, works of the late mining commissions, whose investigations were suffered to end for lack of appropriations.

To-day no one knows, with the slightest approach to accuracy, the status of the mineral industry, either technically, as regards the progress and development making in methods, or statistically, as regards the sources, amounts, and valuations of the various productions.

Statesmen and economists, in whose hands rest the subjects of tariff and taxation, have no better sources of information than the guesses of newspapers and the scarcely less responsible estimates of officials who possess no adequate means of arriving at truth.

In no other intelligent nation is this so; on the contrary, mineral production is studied with the most elaborate effort. England, France, Germany, Austria, Russia, and Italy consider it essential to know, from year to year, not only the source and aggregates of amount and value of mineral yield, but many lesser facts relating to the modes and economies of the industries.

Upon considering the extent of country over which our minerals occur, their wonderful variety and yet unmeasured amounts, it cannot fail to be apparent that no private individual or power is competent to do what ought long since to have been done, namely, to sustain a thoroughly practical investigation and exposition of the mineral industry.

By way of example, and to show how hopeless it is to look to any other source than the government for this service, I select iron.

The best instance of what private association has done in the acquirement of knowledge relating to an American mineral industry is the result reached by the "Iron and Steel Association"; but a glance at their highly valuable performance shows how fragmentary and imperfect it is, and inevitably must be.

Individual States, notably Pennsylvania, Michigan, Wisconsin, Missouri, and Kentucky, have made admirable contributions to the knowledge of American iron, but no common plan underlies their works. They have barely skirmished along the picket lines of the business.

I apprehend no economist, legislator, iron-master, or mine owner would for a moment hesitate to admit that the sum total of information now available on the subject is utterly insufficient for the most intelligent and profitable pursuit of the industry.

The very foundation facts as to the exact chemical nature, geological occurrence, and geographical location of available iron bodies are unknown. In the roughest and most general way perhaps they are known, but in detail, and with the exactness required by modern metallurgy and modern economy, they are not.

The adaptability of iron ores for the increasing number of delicate processes designed to produce special products to meet particular mechanical needs, depends on the presence or absence of minute quantities of accessory elements in the ore. To-day we are ignorant of the presence or quantity of these minute but controlling factors of chemical composition, except in ores of the more important and actually operated mines. As to the great bulk of the ore deposits our knowledge is blank.

The points required to be known by the iron industry are many. Chief among them are the following:

1. Geographical and geological. The position of all iron fields should be known and shown on accurate maps. Besides the general areas embracing groups of iron districts, each special district should be carefully mapped, and the geological relations, size, form, and mode of occurrence of each iron ore body or iron stratum should be illustrated by appropriate graphical methods. In this department the work should not stop with an exhibition of ores already discovered or outcropping upon the surface, but the iron areas should be constantly enlarged by the careful working out of the subterranean bodies by magnetometrical and stratigraphical methods known to geology.

2. Chemical and mineralogical. Every iron-ore occurrence should be analyzed, so that its percentage of iron, its mineralogical characteristics, its tenure of the minutest amounts of foreign substances, valuable or injurious in metallurgy, should be definitely known.

3. Metallurgical association. Besides the geographical, geological, mineralogical, and chemical facts above indicated, it is also required to

know the location, metallurgical character of all the fuels and all the fluxes, and all the refractory material which must in the economy or necessities of the industry be brought together to produce iron.

In a few rare instances all these requisite materials are found in conjunction; in a vast majority of cases they are brought together from distances, which the growing cheapness of transportation is day by day increasing.

An ore from Virginia may be best smelted at Baltimore, when mixed with another from Michigan, by means of a fuel from Pennsylvania and a flux from Maryland. Products the most distant are thus daily brought together and consumed in the blast furnace.

The size of the United States and the wide distribution of iron ores and industries render it unavailing for private individuals or corporations to attempt to gather full knowledge concerning them; and, even if acquired, the competition of trade would hide it securely from the public.

It is the height of absurdity to expect all the iron-producing or iron-containing States to undertake simultaneously an investigation of this problem. If by some miracle of concurrent legislation all such States were to inaugurate the work, it would fail miserably for the want of that very comparative study and unity of method which a single well-directed corps, operated over the whole field, alone could insure.

In order to master this subject, a government corps of geologists, topographers, mining engineers, metallurgists, and chemists is necessary; and this corps must be so directed as not only to inquire into local facts and details, but to institute careful comparison of districts, so that the facts learned in one place may be made to throw light on all others.

To claim that the iron question will ever be adequately investigated as a whole, either by private enterprise or State surveys, is to betray a total lack of appreciation of the character, magnitude, and needs of the industry.

What is true of this single metal is equally true of nearly the whole catalogue of the mineral products of the United States. A few exceptional items, like quicksilver, occur in such restricted areas that private or State enterprises could contribute all the knowable facts and features of the business of production. But as a whole it is true, and can never be refuted, that the Federal Government alone can successfully prosecute the noble work of investigating and making known the natural mineral wealth of the country, current modes of mining and metallurgy, and the industrial statistics of production.

Provided Congress extends the field of the Geological Survey over the whole national territory, and appropriates the comparatively small amounts necessary for the maintenance of the organization, it will be entirely practicable to carry forward this work, and contribute powerful aid to the mineral industries. Of the desirableness, from every point of view, of the results of a general geological survey, I conceive there cannot be two opinions. That these results can only be attained by an organization under Federal patronage, is, in my opinion, scientifically certain.

Granting these two propositions, which the foes of progress may vainly strive to disprove, and there remain but two questions worthy of serious consideration regarding the future policy of this bureau. These are, first, has the Federal Government the Constitutional authority to make a geological survey over the State? and, secondly, can this nation afford the money to maintain such a survey?

In regard to the question of authority, it may be said that the Federal right derived from the Constitution to regulate internal commerce could

hardly fail to carry with it the correlative right to gain a knowledge of those commodities and products which are the very material and basis of commerce; without this knowledge *commerce* is mere *transportation*.

From every analogy of past legislation, Congress has clearly assumed to possess the requisite authority. If it can investigate agricultural industry and maintain a department to execute that branch of inquiry, why not investigate mineral industry? If it can make a coast and geodetic survey over the whole United States, why not a geological survey?

Since the Constitution empowers the Federal Government to levy taxes upon the industries of the nation, there would seem to be a failure in the logic which should deny to it the implied power of informing itself as to the nature and extent of those industries.

Regarding the cost of the Geological Survey, if organized upon a permanent basis, with its jurisdiction extended over the entire United States, there need be no apprehension of the necessity for extravagant amounts.

Five hundred thousand dollars a year, the sum for a long time annually appropriated for the Coast and Geodetic Survey, will be sufficient to carry on all the work which is either necessary or desirable over the whole United States.

Beyond that scale it will not be necessary to go, and with that annual amount a report could be produced annually in each of the eight divisions of the survey which would be of inestimable value to the people and industries of each geographical section.

It is earnestly recommended that Congress extend this work over the whole United States, and place it on a basis of five hundred thousand dollars per year.

The mineral industries of the United States will soon reach an annual money yield of a thousand million dollars of value. The small Federal appropriation of half a million a year toward the development of this great field of American enterprise is certainly not an excessive contribution.

I have the honor to be, very respectfully, your obedient servant,

CLARENCE KING,

Director.

REPORT OF THE COMMISSIONER OF PENSIONS.

DEPARTMENT OF THE INTERIOR,
Pension Office, November 1, 1880.

SIR: I have the honor to submit the following annual report for the fiscal year ending June 30, 1880:

There were on the 30th of June last 250,802 pensioners on the rolls of the several agencies, a net increase since last year of 8,047. The list consists of 133,212 Army invalids, 78,772 Army widows, minor children, and dependent relatives; 2,060, Navy invalids, 1,870 Navy widows, minor children, and dependent relatives; 10,138 surviving soldiers and sailors of the war of 1812, and 24,750 widows of deceased soldiers and sailors of that war. [Table 1.]

There have been added to the pension list within the year, 19,545 names of new pensioners, and 1,377 others restored to the rolls which had previously been dropped. There were dropped from the rolls during the year, for all causes, 12,875 names. [Table 1 and supplement.]

As he rates stood on the 30th of June the annual pension to each pensioner averaged \$103.34, and the annual aggregate pension of all the pensioners was \$25,917,906.60. The actual annual payments, however, exceed this sum by several million dollars. [Table 1.]

The pensions paid during the year, exclusive of the arrears referred to below, amounted to \$37,046,185.89. Of this sum \$12,468,191.20 were first payments upon newly allowed pensions. [Table 1.]

The amount appropriated to meet these payments, exclusive of the salaries and expenses of the agents, was \$37,659,000. [Table 2.]

The act of March 3, 1879, appropriated for the payment of arrears due upon pensions which had been allowed previous to January 25, 1879, the date of the approval of the arrears act, the sum of \$25,000,000 for the pensions, and \$15,000 for expenses of disbursement, of which \$3,933,386.63 was paid out in May and June, 1879, and \$19,980,808.23 during the fiscal year ending June 30, 1880, leaving of the appropriations act of March 3, 1879, a balance of \$1,098,334.04 available for the payment of the arrears of pensions, and \$2,471.10 for the expenses of disbursement. An additional appropriation of \$500,000 for the arrears was made May 31, 1880, so that at the commencement of the present year there was available for the payment of the arrears of pensions \$1,598,334.04, and for expense of disbursement \$2,471.10. (Table 2.)

In this connection your attention is invited to a classified statement of the pensioners on the rolls of each agency, which also compares the whole number of the pensioners of each of the agencies with the number June 30, 1879, and shows the total disbursements for pensions, including salaries and expenses of pension agents, made at each agency during the year. (Table 3.)

The appropriations for the payment of pensions for the current year,

exclusive of the salaries and expenses of the pension agents and the fees of examining surgeons, amount to \$32,050,000. This will be inadequate. As nearly as can now be estimated additional appropriations will be required of \$17,500,000 for Army pensions and \$700,000 for Navy pensions. The extent of the deficiency depends so entirely upon the number of new pensioners who will be placed upon the rolls during the balance of the year, it will be understood that the estimate is quite speculative, and liable to fall below the actual requirements. The appropriation for naval pensions is now nearly exhausted.

Table 4 is a comparative yearly statement showing year by year from 1861 to June 30, 1880, the number of original applications for pension which have been filed and the number allowed, the number of pensioners on the rolls at the end of each fiscal year, and the annual disbursements for pensions, including the salaries and expenses of the pension agents.

SETTLEMENT OF ARREARS.

In a communication which I had the honor to address to you on the 4th of February, 1879, relative to the arrears act of January 25, 1879, the number of pensioners who would be entitled to arrears under its provisions was estimated at 45,155, and the amount which would be required to pay them their arrears of pension was estimated in round figures at \$34,000,000, and at \$25,000,000 if the act should be amended so as to equalize the pensions according to a suggestion which was contained in the same communication. (Ex. Doc. No. 75, 3d session Forty-fifth Congress.) On the 3d of March, 1879, the law was amended substantially as suggested.

Down to the date of this report the arrears of 43,917 of those entitled have been adjusted, and the amount found due them is \$24,600,487.27, an average of \$560.58 to each pensioner. If all the remaining 1,238 cases shall come forward and the average amount due be the same as in the cases already settled, the amount required for the payment of the arrears will exceed the estimate of \$25,000,000 by \$293,963.66. It will be observed that the rates at which the arrears have been adjusted in detail exceed the average of the estimate upon the whole 45,155 cases less than one cent and two mills on the dollar, which, under the circumstances of the adjustments, is an exceedingly slight difference.

This result fully vindicates the plan adopted for rating the arrears, and speaks highly for the unprejudiced judgment and skill of the clerks who were employed upon that work, and particularly of Capt. C. F. Sawyer, who has had charge of all matters touching the settlement of these cases.

Table 5, to which your attention is invited, shows the history of the settlements month by month from April, 1879, when the first cases were adjusted, to October 31, 1880. Nearly six-sevenths of all the cases in which arrears was supposed to be due were settled by the end of September, 1879, and as the work progressed the settlements were distributed in equitable proportions among the pensioners throughout the country.

The clerical labor connected with these settlements has been very great. Formal applications for arrears have been presented in 76,713 cases, and informal applications by letter or personal verbal request by the pensioners and their friends, of which no record was preserved, in not less than 25,000 other cases.

All of these have been drawn from the admitted files and the papers examined, and if the applicant was found entitled to arrears the same

was adjusted and an arrears certificate issued, and if not entitled a letter addressed to him or her stating the fact with the reason why no arrears was due. A great number of these cases, both those in which arrears was found to be due and those in which none was due, have been called up after decision from once to several times each; the former for a review of the rate at which the arrears had been adjusted, and the latter either upon a protest against the unfavorable decision or to obtain further explanation of the ground upon which it was based. It is estimated that these reviews in the aggregate have been nearly, if not quite, equal in number to the original examinations. Not less than four-fifths of the whole labor connected with the arrears settlements was performed within the last fiscal year.

FILING, SETTLEMENT, AND ACCUMULATION OF CLAIMS, AND CONDITION OF THE FILES.

During the nineteen years from June 30, 1861, to July 1, 1880, 412,459 original claims for invalid pension (Army and Navy), and 278,488 claims in behalf of Army and Navy widows, minor children, and dependent relatives were presented, and there have been placed on the pension rolls 168,856 of the invalids, and 193,494 of the widows, minor children, and dependent relatives.

Under the acts of February 14, 1871, and March 9, 1878, granting pensions on account of service in the war of 1812, 34,339 claims of surviving soldiers and sailors, and 40,020 widows of deceased soldiers and sailors of that war had come forward; 25,470 of the survivors and 29,898 widows had been pensioned. (Table 4.)

There were in the files of unsettled cases on the 30th of June last 309,025 original claims of all classes from the Army, and 6,734 from the Navy. In addition to these there were 12,063 claims for increase of pension (Army and Navy), 3,217 claims for pension on account of service in the war of 1812, and 2,469 claims for bounty-land warrants.

Several thousand of the claimants in the Army and Navy original cases died before their claims were settled. In a portion of these the papers have been consolidated with the claims of the widows, minor children, and dependent relatives of the soldier, and are not counted in the foregoing enumeration of claims in the files. The cases of the others who have died leaving their claims unsettled, as well as the cases of those who have abandoned their claims, are counted. The number of claims belonging to the two last-named classes cannot be certainly ascertained, but are estimated at 33,162, leaving 282,597 live original claims of the Army and Navy classes at the close of the year, besides 17,749 claims for increase of pension, for pension on account of the war of 1812, and for bounty-land warrants.

The claims on account of Army service during and subsequently to the war of the rebellion are settled in nine separate divisions, the organization of which will be described further on. The unsettled claims in each of these divisions on the 30th of June last have been tabulated to show the number of invalid and widows' claims, respectively, which were filed in each of the several years since June 30, 1861. The result is shown in Table 6. The unsettled Navy claims are distributed over the period in about the same proportion as the Army.

Claims have been allowed during the year as follows: 10,176 Army and Navy invalids; 4,455 Army and Navy widows, minor children, and dependent relatives; 4,914 on account of the war of 1812; and 1,377 pensioners have been restored to the rolls; 8,991 Army and Navy claims

for increase of invalid pensions; 295 Army and Navy widows' and minor children's increase. Besides these there have been allowed 191 claims for bounty-land warrants, and 29,662 claims for arrears of pension. (Table 7.) The number of original Army and Navy pensions allowed is greater than in any year since 1871.

In view of the great increase in the clerical work outside of that pertaining to the settlement of the cases, growing out of the new claims filed, and the increased correspondence, and the additional labor connected with the preparation of the new record, the result of the year's work is very gratifying.

NEW RECORD OF CLAIMS.

The last annual report made reference to the records of claims as follows:

And to increase the difficulties of the situation, the records of the receipt and disposition of the claims in the office, which had long been felt to be based upon a system unequal to the demands of so extensive a business, and had been the subject of much study with a view of adopting another system as soon as a proper one could be decided upon, proved to be entirely insufficient under the great load of new claims and the multitude of inquiries in the old claims which has followed the passage of the arrears act, and it became necessary to enter at once upon the preparation of a new record of the Army claims which originated or might originate subsequently to March 4, 1861.

The records of these claims have been kept in two series of numbers, one for invalid claims and the other for widows (the latter class including children and dependent relatives), and in two corresponding three-letter alphabetical lists. To illustrate: All surnames the first three letters of which are the same in order are recorded together; the combination "SMI" in the invalid list includes 4,500 names; "WIL," 4,900; "BRO," 3,400; "HAR," 3,900; "CAR," 2,700, &c.

The labor of searching for the name of John Smith, Company A, Sixteenth Illinois Volunteers, is therefore very great, and, besides, the searcher is liable to overlook the name, and this may result in the filing and prosecution of two claims by the same claimant, or in the office informing an inquirer that no such claim has been filed, or in some embarrassing confusion of claims; and these mistakes occur quite frequently with the most practiced and careful searcher, and as the names increase in number the labor and difficulty attending the search of necessity increases.

The system for the new record will separate the names of applicants into their proper military organizations, and a search for the name of John Smith, Company A, Sixteenth Illinois Volunteers, will be confined to the members of his own company who have filed applications for pension, or on account of whose service a widow's claim has been filed.

It is apparent that under such a system there will be great economy of time and labor, and mistakes in searching will be next to impossible except through inexcusable carelessness on the part of the searcher, which has its easy remedy.

The labor of preparing the new record is very considerable; it was commenced in June last, and will probably be completed by February or March next, and until then the old system must be maintained.

My expectations as to the date when these records would be completed have been disappointed; they are not yet complete, although a portion of them are now being used in the current work of the office.

The labor connected with their preparation has been very great as well as difficult. Since 1861, these records have been several times transferred from old books to new by copying, and many clerical errors had occurred which it was necessary to eliminate, and the comparisons and searches have consumed much more time than was anticipated. There has been, however, no disappointment in regard to the advantages to be realized from the new records. The experience already had with them shows that one clerk is easily able to make as many searches as five or six could do with the old records.

The comparisons and searches made in the preparation of these

records have already discovered more than three thousand duplicate claims for pension and fifty-three cases in which two pensions had been granted the same person, not before discovered. Many cases have also been discovered where the soldier, having filed a claim, died before he was pensioned, and the widow or other relative coming in, the soldier's claim was overlooked, thus depriving the widow or other relative of the benefit of evidence essential to the establishment of their claims which the soldier had filed.

These discoveries alone will fully compensate the government for the expense of preparing the new records, to say nothing of the increased facilities which they afford for the transaction of the business of the office and its greater protection against future duplicate claims and pensions.

The new records will comprise 176 volumes of 250 pages each. These, when complete, will contain the claims for pension on account of service in 2,268 regiments, 194 battalions, 706 independent companies, 208 batteries, and 46 staff corps.

REORGANIZATION OF DIVISIONS AND REARRANGEMENT OF THE FILES.

Your attention is invited to Table 8, showing the average number of claims of each of the several classes filed per month during the year ending June 30, 1878, and the average per month from July to December, 1878, inclusive, and the number each month from January, 1879, to October, 1880, inclusive.

The great increase in the number of claims following the passage of the arrears act, together with the increased number of claims previously filed which were called up and pressed for settlement, including many thousand which were revived by that act, overloaded the system of record and files to such a degree that it was not only impossible to record the claims as they came forward, but the letters of inquiry and additional evidence accumulated to such an extent as to threaten the utmost confusion.

As already stated, a new system of records was devised, but the new records could not be prepared for many months, and not early enough to meet the emergency. Congress was about to convene, and with its presence a great increase in the correspondence was to be expected. A new plan was at last hit upon for reorganizing the clerical force employed in the Invalids' and Widows' Divisions, and arranging the files to correspond, which promised partial relief, and has enabled the office to escape the confusion which seemed imminent and considerably increased the number of settlements.

The principal advantages derived from this arrangement are found in the division of the cases so that a more intelligent judgment can be brought to bear upon the evidence than was possible under the previous organization, and in the facilities which it furnishes for quickly finding the file pertaining to any particular case when the number of the claim and the State from which the soldier served is known. In all such cases it relieves the records of all searches; with this data the file clerk can at once place his hand upon the proper file.

The change is regarded of such importance as to justify the insertion of a copy of the order organizing the new divisions. Table 6, before referred to, shows the whole number of original claims upon the files of each of the nine new divisions on the 30th of June last, and the number filed in each year since 1861 remaining unsettled.

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DEPARTMENT OF THE INTERIOR,
PENSION OFFICE,
Washington, D. C., November 20, 1879.

ORDERED: *The Invalid and Widows' Divisions* are abolished. Their files will be consolidated and arranged by States, keeping the invalid and widows' claims separate, and each class in numerical order in its series.

Nine new divisions are created, to have charge of the settlement of the claims in these files, as follows:

1. *New England Division* (C. L. Whelpley, Chief), to be in charge of the claims on account of military service in organizations belonging to the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.
2. *New York Division* (Fred. Mack, Chief), to be in charge of the claims on account of military service in organizations belonging to the State of New York.
3. *Pennsylvania Division* (J. R. Van Mater, Chief), to be in charge of the claims on account of military service in organizations belonging to the State of Pennsylvania.
4. *Ohio Division* (F. D. Stephenson, Chief), to be in charge of the claims on account of military service in organizations belonging to the State of Ohio.
5. *Indiana Division* (F. W. Poor, Chief), to be in charge of the claims on account of military service in organizations belonging to the States of Indiana and Michigan.
6. *Illinois Division* (George A. L. Merrifield, Chief), to be in charge of the claims on account of military service in organizations belonging to the State of Illinois.
7. *Iowa Division* (John M. Comstock, Chief), to be in charge of the claims on account of military service in organizations belonging to the States of Iowa, Wisconsin, Minnesota, Kansas, Nebraska, Colorado, California, Nevada, and Oregon, and the several Territories.
8. *Southern Division* (L. E. Dickey, Chief), to be in charge of the claims on account of military service in organizations belonging to the States of Missouri, Kentucky, Tennessee, Arkansas, Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, and West Virginia.
9. *Washington Division* (C. Hiccox, Chief), to be in charge of the claims on account of military service in organizations belonging to the States of Delaware, Maryland, and New Jersey, and the District of Columbia, and the several organizations of the Regular Army, and colored troops, and in all other general organizations not belonging especially to any State or Territory.

These divisions will each be organized with three principal examiners, who will be designated by the Commissioner; and one of whom, in the order named in the assignment, will, in the absence of the chief, act in his place.

J. A. BENTLEY,
Commissioner.

INDIAN PENSIONERS.

Three regiments of troops, First, Second, and Third, Indian Home Guards, were raised among the Indians of the Indian Territory, to serve in the Union Armies in the late war. Several hundred claims for pension based upon service in these organizations have been filed. The character, habits, and customs of the Indians rendered it difficult and even impossible in most cases for the claimants to establish their right to pension by the usual methods and under the rules and regulations of the office. Early in the year 1866, Ex-Secretary Harlan undertook to bridge these difficulties by sending to the Territory George C. Whiting, who was instructed to inquire into the merits of the claims and was authorized to make payment to those whom he found to be entitled. Mr. Whiting settled and paid the accrued pension in about one hundred cases; other pensions were afterwards allowed, and altogether 178 were allowed on account of this service before the beginning of 1871. About this time, or perhaps earlier, facts were brought to the attention of the office indicating that both the government and the pensioners and claimants were being defrauded by their attorneys and others connected with the cases; and the papers in the admitted cases, as well as those belonging to three hundred and twenty-three others which were pending, were placed in the hands of Messrs. F. E. Foster and G. E. Webster, with instructions to investigate the alleged frauds.

On the 18th of July, 1871, upon the report of Special Agents Foster and Webster, the payment of all the pensions which had been allowed and the further consideration of the pending claims was suspended.

On the 20th of January, 1872, payment of 42 of the pensions was resumed, but their payment was again suspended on the 5th of February, 1873. Except two pensioners who have been paid through inadvertence, no payments have been made in any of the cases on account of the service mentioned since February, 1873.

After the passage of the law contained in section 4721, Revised Statutes, act of March 3, 1873, consideration of the pending claims was resumed and continued until June 6, 1874, when the consideration of the claims was again suspended because the evidence which was being produced was so unreliable and unsatisfactory as to preclude intelligent and proper action.

On the 11th of October, 1875, the papers both in the cases which had been admitted and those pending were placed in the hands of C. W. Seaton and W. T. Vandoren, who were directed to again investigate them.

It appears that no action was taken upon their report, since the pensions and the pending claims remained suspended, until the 12th of August, 1879, when the papers in all the cases were placed in the hands of Messrs. A. Vangueder and T. Shailer, with ample instructions and discretion, written and verbal, to proceed to the Indian Territory and make another inquiry into the merits of the respective cases.

Mr. Vangueder had served in the same campaigns with the Indian regiments for two years and upwards, and for more than one year was brigaded with them, and was, therefore, peculiarly qualified for this inquiry. The task imposed upon these gentlemen was successfully accomplished, as will appear from the following summary of the present condition of the claims:

The earlier investigations had discovered that 46 of the 179 pensions which had been allowed had ceased by reason of the death or remarriage of the pensioners. The investigation of 1879 shows that the pensions of 30 others have also expired from the same causes; that 9 others ought never to have been granted, the pensioner having never been entitled; 56 others have never appeared before either of the commissions or agents who have been in the Territory since the return of Mr. Whiting, and it is presumed that few, if any of them, will ever come forward. It is recommended that payment be resumed in the remaining 38 cases.

Of the 370 pending claims investigated by Messrs. Vangueder and Shailer, 43 have already been approved for pension, and 160 will be disallowed; of the remaining 167 cases 24 are duplicates, and the information obtained by the agents indicates that not more than thirty or forty, at most, of the remaining cases will be further prosecuted.

Messrs. Vangueder and Shailer while in the Territory received declarations and evidence in new claims as follows: 13 invalids, 33 widows, 47 minor children, and 7 dependent relatives, 102 in all; 86 of them are approved for pension, 7 will be disallowed, and 9 remain undetermined.

It is a matter of satisfaction that at last some progress has been made towards the settlement of the vexing questions relating to the pensions on account of the service of the Indian Home Guards.

The following extracts from the report of Messrs. Vangueder and Shailer will be interesting as well as instructive in this connection:

* * * We prepared declarations and reduced to writing testimony in 102 new cases. Seventy of that number were made on account of service in the First Indian Home Guard Regiment. This regiment was made up principally of Creeks, Seminoles, and Euchees. At the time the Indian pension claims were prepared by Wright, at

Fort Gibson, the members of that regiment and the Indian families had returned to their former homes, from 50 to 125 miles distant from Gibson. This may account for the small number of claims prepared by said Wright for the heirs of deceased members of that regiment. The unusual high waters throughout the Indian Territory during the stay of Messrs. Foster and Webster at Fort Gibson made it impossible for the women and children to cross the several rivers between their homes and that place, and in consequence thereof but a few of the cases of that regiment were called up before those gentlemen.

The general publicity given to our presence in the Territory, and the desire manifested on the part of the Indians to obtain a final settlement of their pension claims, leads us to believe that the number of cases hereafter to be called up will not be large, and that in a large percentage of the cases now remaining without evidence sufficient to justify action thereon, the person named as claimant has no existence.

We deem it proper, in submitting this report, to state that in no case were any statements reduced to writing or declarations prepared for the Indians until we were entirely satisfied of their identity.

We made it a rule, as far as practicable, to refuse the testimony of soldiers other than members of the same company, and only varied therefrom when it was shown that the witnesses and the soldier in question, although serving in different companies, were by reason of their former relation more closely associated during service than others of the same company not members of the same band prior to enlistment. Unless otherwise shown in the testimony, all statements made before us may be accepted as having been made by persons having had personal knowledge of the facts to which they testified.

In the cases of widows, minors, &c., probably entitled to your favorable consideration, the death of the soldier did not only occur in the service, but with a few exceptions the record, although not always as definite as would be desired, shows that fact. Pneumonia and small-pox were the principal causes of death among the Indian soldiers. One thousand and seventy-five deaths are shown in the three regiments, and 75 per cent. are small-pox cases. The casualties from other causes are light, only 48 discharges on account of disabilities being shown by the record, notwithstanding the fact that a large number were wounded and afterwards unfit for duty, but were permitted to remain with the command, and kept on the rolls until the final disbandment of the regiments, probably because of the disturbed condition of their country.

The greatest difficulty encountered by us was that of fixing the ages of the children. A record of births is found now and then among the Cherokees; none among the Creeks or Seminoles. The Indians have little conception of time; particularly is this true of the females. The latter as a class we found utterly unreliable on questions involving calculation of time, and were, therefore, compelled to accept the statements of males. The "old men" were of the most value to us in arriving at ages, but yet their approximations would in most cases differ considerably from our own. The appearance before us of every child claimed for was deemed essential, and was insisted upon in all cases, unless it was shown that the child was sick and unable to travel. With exception of probably a half dozen every child claimed for was before us.

The minors will not burden the pension rolls after this year, they having now passed beyond the pensionable age, with probably one or two exceptions, and most of them reached the age of sixteen years long since.

Of invalids there are comparatively but few claims, and those mostly gun-shot wound cases.

Much of our time was occupied by persons desiring to make claim for pension. But when after an examination of the witnesses it appeared that they had no title under the law, we so informed them and declined to prepare declarations or reduce the testimony to writing. Of this class of cases probably 200 came before us, among them a large number of mothers, fathers, sisters, and brothers.

We procured all the evidence obtainable in a few of the dependent cases in which declarations had been prepared by our predecessors, Messrs. Seaton and Van Doren, and also in one or two prepared by us, and submit the same without comment, other than that the habits and customs of the Indians almost preclude the possibility of establishing the most essential point in a dependent case—that of actual or intended support of the parent on the part of the son.

Altogether, there are 167 of the Indian pensions now ready or nearly ready for payment, to wit: 21 invalids, 87 widows, and 59 minors.

In each case there is a considerable sum of accrued pension due, which, as the law now stands, must be paid by a check upon some one

of the assistant treasurers or other government depository, and mailed to the pensioner in the Territory (see section 4765, Revised Statutes).

The fact that there are no banks or other financial institutions in the Territory upon which the pensioners can depend to exchange at a reasonable rate current money for their pension checks, added to the general unfamiliarity of the Indians with business transactions, exposes the Indian pensioners to the danger of being overreached and defrauded of a great share of their pensions by the unscrupulous speculators and adventurers who are known to infest the Indian and frontier settlements, unless some precaution shall be taken for their protection.

The great distance of these pensioners from the nearest agency for the payment of pensions renders it impracticable to require them to appear personally at the agency and receive their pensions as provided in section 4765, Revised Statutes, referred to. It is moreover questionable whether such considerable sums of money as are now due them ought to be placed all at once in the pensioners' hands. I am clearly of the opinion that it should not be done, and that not more than two hundred dollars of the accrued pension should be paid to any Indian pensioner at one time. I respectfully recommend, therefore, that a law be enacted authorizing the department to pay the accrued pensions to Indian pensioners in installments.

If the accrued pensions shall be paid in moderate installments, it is probable that the pensioners will be able to obtain the money for their pension checks of the merchants in the Territory at reasonable rates of exchange, and not be subjected to exorbitant and ruinous rates as they otherwise would be.

PENSIONERS RESIDING AT THE NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS.

Upon an average there are about 2,450 pensioners who reside at the various branches of the National Home for Disabled Volunteer Soldiers, where they are maintained at the public expense. Their pensions amount annually to about \$300,000.

Considerations connected with discipline and proper government among the inmates have influenced the managers of the Home to request the payment of all the pensions to their treasurer, to be disbursed by him under their direction. This request was formerly acceded to in all cases, but more lately the arrears under the acts of January 25 and March 3, 1879, and the accrued pensions due in newly-allowed cases, have been paid directly to the pensioners, paying to the treasurer of the Home only such portion of the pension as accrues while the pensioner continues to reside there.

The managers of the Home claim that under the clause of section 4825, Revised Statutes, authorizing them "to make by-laws, rules, and regulations, not inconsistent with law, for carrying on the business and government of the Home, and to affix penalties thereto," they may require a pensioner, as a condition of his admission to the Home, to assign to them his pension, notwithstanding the provisions of section 4745, declaring void any pledge, mortgage, sale, assignment, or transfer of any right, claim, or interest in any pension; the provisions of section 4747, declaring the pension not liable to attachment, levy, or seizure by or under any legal or equitable process whatever; the provisions of section 4766, declaring that "hereafter no pension shall be paid to any person other than the pensioner entitled thereto, nor otherwise than according to the provisions of this title; and no warrant, power of attorney, or other

paper executed or purporting to be executed by any pensioner to any attorney, claim-agent, broker, or other person shall be recognized by any agent for the payment of pensions, nor shall any pension be paid thereon"; and the provisions of section 4765, requiring a voucher to be executed by the pensioner, &c., and further providing that the check shall be made payable to the pensioner's order and delivered to him. There is, in my opinion, no law providing for the payment to the officers of the Home of the pensions due the inmates, except on the condition expressed in section 4832 of the Revised Statutes, to wit, cases where the pensioner has neither wife, child, nor parent dependent upon him; and this difference of opinion has produced some friction between this office and the officers of the Home, which it is desirable to obviate.

So important a matter ought not to be left to depend upon the construction which may be given to these statutes by officers whose duties are so entirely independent of each other as are those of the Commissioner of Pensions and the Managers of the Home. The different readings which have been given these statutes have already caused some embarrassment to the service. I therefore respectfully recommend that the subject be brought to the attention of Congress, and that body be requested to define the powers and duties of the Commissioner of Pensions and the Managers of the Home in relation to the pensions of the inmates thereof.

INSANE AND IMPRISONED INVALID PENSIONERS.

In cases of insane invalid pensioners the pension can be paid only to a properly authorized guardian of the pensioner.

In many of these cases the expenses of guardianship are a heavy charge upon the dependent family, and in most, an entirely useless one. It is therefore recommended that the law be amended so as to provide that in cases of insane invalid pensioners having no guardian, but having a wife or children dependent upon him (the wife being a person of good character, and not having abandoned the pensioner nor his children) the Commissioner of Pensions be authorized, in his discretion, to cause the pension to be paid to the wife, upon her properly executed voucher, or, in case there is no wife, upon the voucher of the guardian of the children.

Similar provisions should be made in the cases of invalid pensioners who are imprisoned as punishment for offenses against the laws.

REMARRIED WIDOWS—COMMENCEMENT OF MINOR CHILDREN'S PENSIONS.

There are many cases of widows who have been pensioned and remarry, but conceal the remarriage from the government and continue to draw their pensions, and after a longer or shorter period has elapsed the children of the soldier come forward and claim the pension from the date of the widow's remarriage.

The statute, if administered according to its literal terms (section 4702, Revised Statutes), would commence their pension from that date, notwithstanding they may have resided with and been supported by the mother meantime. The Department, in order to protect the government against the payment of the pension twice over the same period, has held that the pension paid to the widow in such cases after her remarriage may be deducted from the minors' pension.

This instruction of the department is unquestionably in accordance

with the spirit of the law, but the language of the statutes does not clearly express this intent.

In my annual report for both 1877 and 1878 allusion was made to the subject; and, in order to avoid doubt and future questions, I respectfully renew the recommendations then made that the law be so amended as to provide, "that where the children have resided with and been supported by the widow of the soldier their pension shall commence at the date to which the widow was last paid."

INCREASE OF INVALID PENSION, SECTION 4698½—REVIEW OF PREVIOUS RATINGS.

The statutes relating to the subject of increasing invalid pensions on the ground of an increased degree of disability and regulating reviews of former ratings alleged to have been unjust are meager and indefinite; indeed, touching the latter point there is no statute whatever, and the proceedings in such cases rest entirely upon precedent, and as almost every case presents circumstances differing from former cases the consequence is a great want of uniformity of action.

The law relating to the increase is found in section 4698½, which provides that the increased rate shall not commence at an earlier date than the date of the medical examination. In view of the delays which now attend the settlement of claims it is manifestly unjust to require a claimant for an increase of pension to forego the increased rate which properly belongs to him until the office shall cause him to be examined by a surgeon.

I respectfully recommend, therefore, that section 4698½ be repealed and an act passed containing substantially the following provisions: That if any invalid pensioner shall think his pension is not commensurate with the degree of his disability, either because it has been improperly rated by the Commissioner of Pensions, or because the disability for which he was pensioned has increased, or because he has another disability incurred in the service, for which he is not pensioned, he may apply to the Commissioner of Pensions for an increase of his pension, and said application shall be considered and determined in the same manner as his original application, so far as such proceedings may be applicable to his case; and the Commissioner of Pensions shall cause any invalid pensioner to be examined by a surgeon as often as he shall deem it for the interest of the government or of the pensioner, and if, upon such examination, it shall appear that the pension enjoyed by the pensioner is not according to the degree of his disability, the same shall be readjusted and rerated according to right and justice, provided that in cases where the increase is granted for the reason that the disability has increased since the pension was last rated by the Commissioner of Pensions, such increase shall commence at the date of filing application therefor; and provided further, that all applications for increase on the ground that the pension has been improperly rated, made more than one year after such alleged improper rate was fixed by the Commissioner of Pensions, shall be treated and settled as in the case of increase claims on the ground of an increase of disability.

ATTORNEYS AND ATTORNEYS' FEES.

Since the passage of the act of June 20, 1878, which limits the fee of agents and attorneys to ten dollars and repeals section 4785 of the Revised Statutes authorizing the Commissioner of Pensions to fix the amount of

fee which an agent or attorney might receive in a pension claim (said section being a part of the title relating to pensions), there is grave doubt whether the penal provisions of section 5485, are applicable to the offense of contracting for, demanding, receiving or retaining an illegal fee.

This statute is one of great importance in protecting claimants from oppressive demands of their agents or others who become connected with the prosecution of the claim, and I therefore respectfully recommend that said section be amended so as to remove all doubt upon that point by striking out the words "in the title pertaining to pensions" where they occur in the fifth line of the section, and inserting in lieu thereof the words "by-law."

Instances are not unfrequent of agents and attorneys, who have been disbarred from practice by the order of the department, continuing to hold themselves out to claimants as competent and properly qualified persons to transact business before this bureau, and under such pretense receive fees, thus practically nullifying the order of disbarment.

One notable and very gross case of the kind has been brought to my notice, that of Gilmore & Co., of this city, who were lately disbarred. Since their disbarment, this firm, concealing the fact of their disbarment from their clients and holding out to them that they were still transacting their business, has collected fees in a considerable number of pension cases, and when the claimants were subsequently notified of the disbarment, they have complained of the imposition which had been practiced upon them.

Under the law as it now stands there appears to be no proper protection of the department against the disbarred attorneys, and no ample remedy for claimants who are thus imposed upon and defrauded of their money. I therefore respectfully recommend that a law be enacted making it a penal offense for any person who is disbarred from practice before the bureaus of the department to hold himself out to claimants or others as a competent and proper person to be intrusted with their business before the department or any of its bureaus or to collect or receive fees or compensation for any service rendered or to be rendered in matters pending in the department while the order of disbarment is in force.

CHANGE OF SYSTEM FOR PRESENTING EVIDENCE IN CLAIMS.

Your attention is again invited to the subject of a change in the method of presenting the evidence in claims and making the medical and surgical examination of invalid claimants and pensioners.

The necessity of substituting for the present secret *ex parte* method a plan for taking the testimony in support of the claims before officers of the government by public proceedings in the neighborhood of the claimant and witnesses becomes more and more urgent as the number of claims, and the amount involved in each case, increases, both to secure an early and just settlement of meritorious claims and to protect the Treasury against fraud.

It is unnecessary to repeat the various considerations which have been urged in support of my former recommendations upon this subject, or to supplement them with the numerous additional suggestions to the same purpose which might be made, and I therefore dismiss the topic with a respectful and earnest recommendation that the attention of Congress be again called to the importance of early legislation of the nature above pointed out.

Table 6 classifying the unsettled Army claims according to the year in which they were filed, and the supplemental table classifying the invalid Army claims which have been allowed each year from 1871 to 1880, according to the year in which they were filed, illustrates the delays which pension claimants have experienced in the settlement of their claims.

CORRESPONDENCE.

The mail received has been greater than in any previous year, the letters and communications of all classes with the applications and evidence aggregate 891,513 separate pieces, and this number does not include many personal inquiries nor thousands of letters relating to the arrears claims. The written and personal inquiries of members of Congress number nearly 40,000.

The tone of much of the correspondence, as well as that during the succeeding months down to October last, was embittered by the delays the causes of which the claimants did not understand, or about which they were misinformed. Explanations were made in individual cases, but they reached comparatively few and did not inform the great mass of claimants of the circumstances which caused their embarrassment and on the 1st of October, I issued a circular letter setting forth the great accumulation of business and some of the more immediate causes of the delays which I caused to be mailed to the claimants generally throughout the country.

It is gratifying to be able to state that as soon as the claimants became informed of the facts the denunciatory and bitter tone of their inquiries almost entirely ceased.

SPECIAL INVESTIGATIONS.—FRAUDS.

Attention is invited to Table 9, showing the operations of the year under the provisions of Section 4744 Revised Statutes.

Out of an appropriation of \$40,000 to pay the expenses of the clerks detailed to make the investigations only \$26,466.19 was expended. The crowded condition of the office-work rendered it inexpedient to detail the usual number of clerks for this duty, and the same conditions continue to be operative.

During the last four years, the investigations have been very thorough and made with great care, and so conducted as to furnish the pensioners and claimants, whose cases were under investigation, as ample opportunity as possible under the system for presenting to the office all the facts, connected with their cases, which might tend to clear them from the suspicion which had attached.

The number of frauds discovered year after year, when it is considered that the attention of the office was attracted to them through accident, or some suspicious circumstance, or by the statement of a volunteer informer, is very great, and renders it certain that but a very small percentage of the frauds committed come to the knowledge of the office.

PENSION AGENCIES.—PAYMENT OF PENSIONS.—COMPENSATION.

It is with great satisfaction that I allude to the pay service.

The consolidation of the agencies for paying pensions under the order of the President, dated May 7, 1877, has worked a great reform in the service, not only in the direction of economy, but in the rapidity and promptness with which the quarterly payments are made.

At the last September payment, the agents paid in the first ten days (not counting the two Sundays which intervened) 184,903 pensioners, 23,527 in person at the agencies and 161,376 by mail. The former quarterly payments, under the consolidation, were made with great rapidity but this considerably exceeds any of the others in that respect.

The responsibilities of these officers are very great and the expenses of their offices necessarily large, and they justly complain that the salary, fees, and allowances are not sufficient to enable them to conduct their offices properly and have remaining to themselves, after the payment of the expenses, a fair compensation for their services and the responsibility imposed upon them.

I respectfully recommend that the law fixing their salary, fees, &c., be revised and their compensation increased by extending to them the right to use an official penalty envelope in their official correspondence.

The duties of the agents in making the arrears payments were very much more burdensome and expensive than was expected and estimated at the time of the passage of the act of March 3, 1879, making the appropriation for the payment of these pensions. That act fixed the fee for each payment at 30 cents, and appropriated the sum of \$15,000, or so much thereof as might be necessary, for its payment. The expense of these payments was little, if any, less than 50 cents in each case upon the average, to say nothing of the additional official responsibility, and I therefore recommend that the law be so amended as to allow them an additional fee of 20 cents for each payment, and that the sum of \$10,000 be appropriated for the payment of the same.

CLERICAL FORCE.—SALARIES.

The clerical force of the office is generally industrious and efficient, and the salaries paid to many of the clerks, as well as to the officers of the bureau, are small and less than should be paid for the duties which they are required to, and do perform, and in a considerable number of instances the salary received by clerks is inadequate to the comfortable maintenance of themselves and their families.

I respectfully submit the following recommendations :

1. That there be an increase in the number of clerkships of the classes 1, 2, 3, and 4.
2. That the chiefs of divisions and the appeal clerk, who are selected from among the clerks of class 4, be given an additional allowance of \$600 each per annum.
3. That the salary of the chief clerk be increased to \$2,500 per annum.
4. That the salary of the Deputy Commissioner of Pensions be increased to \$3,000 per annum.
5. That the salary of the Commissioner be increased to \$6,000.

Very respectfully,

J. A. BENTLEY,
Commissioner of Pensions.

Hon. CARL SCHURZ,
Secretary of the Interior.

TABLE I.—Number of pensions allowed and increased during the year, with their annual value, together with the yearly value of all pensions on the roll, and the amount paid for pensions during the year.

Pensions allowed and increased during the year.												
Original.			Increase.		Restoration.		Dropped from the roll.			Reduction in rate.		
Num-ber.	Yearly value.	Num-ber.	Yearly value.	Num-ber.	Yearly value.	Num-ber.	Yearly value.	Num-ber.	Yearly value.	Whole number of pen-sioners on the roll June 30, 1880.	Yearly value of pen-sions as shown by the roll June 30, 1880.	
9,885	\$694,666 18	8,917	\$419,089 00	1,146	\$57,285 00	2,949	\$355,030 00	149	\$8,065 68	133,212	\$13,498,961 22	
Army { Invalids.....												
4,254	623,449 05	280	12,992 00	172	17,798 00	6,828	762,824 00	2,554	64,211 64	78,772	8,515,565 20	
Army { Widows, &c.....												
311	27,082 20	74	4,810 00	21	1,365 00	116	11,232 00	.....	.....	9,040	247,232 18
Navy { Invalids.....												
201	27,252 00	15	540 00	2	312 00	105	13,689 00	48	1,368 00	1,870	318,580 00	
Navy { Widows, &c.....												
284	27,264 00	.....	.....	34	3,264 00	1,801	177,898 00	.....	.....	10,138	973,248 00
War of 1812 { Survivors.....												
4,630	444,480 00	.....	.....	2	192 00	1,076	103,298 00	.....	.....	24,750	2,876,000 00
War of 1812 { Widows of, &c.....												
Total.....	19,545	1,746,173 43	9,288	437,441 00	1,377	80,194 00	12,875	1,423,967 00	2,751	73,645 82	250,802	25,917,906 80
191 claims for bounty land and 28 662 claims for arrears of pensions were allowed during the year.												
Total amount paid during the year to new pensioners, upon first payments, is to—												
Army invalids.....												
Army widows, &c.....												
Navy invalids.....												
Navy widows, &c.....												
War of 1812 survivors.....												
War of 1812, widows of, &c.....												

191 claims for bounty land and 29,662 claims for arrears of pensions were allowed during the year.

Total amount paid during the year to new pensioners, upon first payments, is to—

Army invalids.....	\$7,230,959 09
Army widows, &c.....	4,215,871 78
Navy invalids.....	159,159 41
Navy widows, &c.....	135,201 62
War of 1812 survivors.....	54,816 70
War of 1812, widows of, &c.....	668,182 10
Total.....	12,468,191 20

\$148,679 paid for pensions during the year was paid to claim agents for their fees in claims which were filed prior to June 20, 1878.
For arrears payments see Table 2.

SUPPLEMENT TO TABLE 1.—Number of pensioners of the various classes dropped from the roll during the year, with the cause, and the number of each class on the rolls June 30, 1880.

Cause for which dropped	Invalids.	Widows, minors, and dependent relatives.	War of 1812.							Total number of pensioners of all classes.
			Widows with children.	Widows without children.	Persons representing children.	Dependent fathers.	Dependent mothers.	Brothers and sisters.	Total number of children.	
								Survivors.	Widows of, &c.	Total.
Loss to the roll by death.....	1, 650	658	79	165	30	90	280	166	664	1, 509
By remarriage.....		720	345	288			32	606	7	7
Minors, by legal limitation.....		4, 166			4, 159			8, 714		
Failure to claim pension.....	1, 160	1, 315	133	437	248	74	363	392	387	1, 333
Dropped for other causes.....	255	74	16	16	1	7	34	21	18	28
Total loss to the roll.....	3, 065	6, 933	573	926	4, 438	171	738	9, 899	1, 076	2, 877
Number of pensioners on the roll.....	135, 272	80, 642	10, 798	30, 986	6, 546	2, 396	21, 505	10, 138	24, 750	34, 886
										250, 862

TABLE 2.—*Appropriations for the payment of pensions for the year and the amount of disbursements during the year.*

	Army.		Navy.	
	Appropriations.	Disbursements.	Appropriations.	Disbursements.
For pensions	\$36,900,000 00	\$36,293,413 92	\$739,000 00	\$752,771 97
For fees to examining surgeons	202,500 00	72,277 14	2,000 00	1,886 00
For compensation to pension agents, expenses, &c.	238,500 00	209,699 17	4,000 00	3,846 85
Total	37,340,000 00	36,575,390 23	765,000 00	758,504 82

The appropriations and disbursements on account of arrears of pensions under the acts of January 25 and March 3, 1879, are not included in the above statement, the details of which are as follows, to wit:

Appropriation for the payment of arrears of pension, act March 3, 1879. \$25,015,000 00

Disbursements during the fiscal year of 1879 [May and June]:

Paid for arrears of Army invalids	\$2,933,756 97
Paid for arrears of Army widows, &c.	985,771 00
Paid for arrears of Navy invalids	8,752 16
Paid for arrears of Navy widows, &c.	3,215 00
Cost of disbursements on the same	1,891 50

Total amount paid for the fiscal year ending June 30, 1879 3,933,386 63

Balance of appropriation on hand July 1, 1879 21,081,613 37

Disbursements during the fiscal year of 1880:

Paid for arrears of Army invalids	\$14,857,548 53
Paid for arrears of Army widows, &c.	4,853,550 67
Paid for arrears of Navy invalids	152,508 39
Paid for arrears of Navy widows, &c.	106,563 24
Cost of disbursements on the same	10,637 40

Total amount paid during the fiscal year ending June 30, 1880.. 19,980,808 23

Total paid on account of arrears since passage of arrears acts \$23,914,194 86

Balance..... 1,100,805 14

Add deficiency appropriation, act approved May 31, 1880 500,000 00

Balance of appropriation on hand July 1, 1880..... 1 600,805 14

TABLE 3.—A classified statement of pensioners on the rolls of each agency, the whole number of pensioners of each agency, compared with the number June 30, 1879, and the disbursements for pensions for each agent during the year.

Location of agency.		Army.		Navy.		War of 1812.		Disbursements on account of pensions during the year.		Total disburse- ments.		Number of pensioners on the rolls June 30, 1880.	Number of pensioners on the rolls June 30, 1879.
City.	State.	Invalids.	Widows, &c.	Invalids.	Widows, &c.	Survivors.	Widows, &c.	For regular pen- sions.	For arrears of pensions.	Salary and ex- penses of agents.			
Boston.....	Massachusetts	9,082	7,119	462	397	782	2,044	\$2,726,029 28	\$1,050,452 19	\$14,686 32	\$3,791,167 79	19,896	19,175
Chicago.....	Illinois	12,092	5,744	76	44	461	953	3,247,225 80	1,889,783 41	16,350 33	5,153,359 57	19,370	18,456
Columbus.....	Ohio	12,533	7,875	46	70	418	2,026	3,247,115 30	1,913,072 01	18,528 53	5,178,715 84	23,368	23,103
Concord.....	New Hampshire	9,419	6,968	140	114	1,275	3,125	2,721,367 43	1,321,176 59	17,341 85	4,039,905 87	21,031	20,640
Des Moines.....	Iowa	7,871	2,727			247	492	1,804,898 85	1,119,893 15	11,175 07	3,025,987 07	11,327	10,397
Detroit.....	Michigan	6,770	2,727	22	22	365	667	1,452,054 62	905,852 47	10,858 10	2,368,765 19	10,918	10,748
Indianapolis.....	Indiana	9,515	4,628			296	732	2,096,921 20	1,536,966 55	13,082 26	3,646,900 01	15,145	14,941
Knoxville.....	Tennessee	4,209	4,687	78	85	2,104	5,939	2,273,250 09	974,014 88	13,641 66	3,290,906 63	17,102	16,421
Louisville.....	Kentucky	2,355	2,018	6	16	437	969	963,642 30	596,213 55	7,476 04	1,567,531 89	6,701	6,598
Milwaukee.....	Wisconsin	6,704	3,276	25	21	249	377	1,956,190 26	1,124,642 84	9,715 90	3,090,549 00	10,653	10,023
New York.....	New York	6,607	5,628	462	375	648	2,288	2,151,850 96	1,287,219 93	17,221 12	3,456,292 01	15,308	14,602
Philadelphia.....	Pennsylvania	9,049	5,660	291	312	276	966	2,455,730 12	1,336,006 57	15,413 19	3,807,149 88	16,584	16,094
Pittsburgh.....	do	7,715	4,105	39	46	275	739	1,950,807 15	1,066,508 65	11,743 20	3,029,119 40	12,919	12,225
Saint Louis.....	Missouri	8,146	3,157	29	18	301	761	2,022,960 60	1,349,102 18	11,582 06	3,383,644 83	12,472	12,043
Saint Francisco.....	California	1,119	266	48	13	57	62	233,949 63	122,068 50	5,022 44	361,040 57	1,595	1,498
Syracuse.....	New York	9,204	6,040			1,005	2,219	2,633,376 68	1,174,324 68	15,457 71	3,828,169 05	18,468	18,077
Washington.....	District of Columbia	10,818	4,712	336	337	1,422	1,331	3,018,535 15	1,202,842 85	14,887 64	4,226,285 44	17,956	17,750
Total number of pensioners.....		133,212	78,772	2,060	1,870	10,138	24,750	37,046,185 89	19,970,170 83	224,183 42	57,240,540 14	250,802	242,765
Increase during the year.....		8,062	2,402	216	98	1,463	8,556	7,403,755 76	16,038,675 70	17,582 49	23,460,013 95	8,047	.....
Decrease during the year.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 4.—Number of pension claims filed and allowed each year since July, 1861, and the number of pensioners at the close of each year, together with the annual amounts paid on account of pensions since July 1, 1860.

	Army.		Navy.		Army and Navy.		War of 1812.				Total number of applications filed.		Total number of claims allowed.		Number of pensioners on the roll and the amount paid for pensions with the cost of disbursements.			
	Invalid.	Widows.	Invalid.	Widows.	Invalid.	Widows.	Applications filed.	Survivors.	Widows.	Claims allowed.	Survivors.	Widows.	Total number of claims allowed.	Total number of applications filed.	Invalids.	Widows, &c.	Total.	Disbursements.
1861.....	1,362	1,000	60	65	413	49	.....	.....	.....	.....	.....	.....	.....	.....	4,337	4,299	8,636	\$1,072,461 55
1862.....	26,380	22,377	290	285	4,121	3,763	.....	.....	.....	.....	.....	.....	.....	.....	4,341	3,818	8,169	790,384 76
1863.....	20,293	32,627	385	324	17,041	22,446	.....	.....	.....	.....	.....	.....	.....	.....	7,821	6,970	14,791	1,025,139 91
1864.....	27,299	44,464	455	468	15,212	24,959	.....	.....	.....	.....	.....	.....	.....	.....	23,479	27,656	41,135	4,504,016 92
1865.....	35,789	28,732	350	375	22,883	27,284	.....	.....	.....	.....	.....	.....	.....	.....	35,880	50,106	85,986	8,625,153 11
1866.....	15,905	20,265	250	333	16,589	19,883	.....	.....	.....	.....	.....	.....	.....	.....	55,652	71,070	126,722	13,458,996 43
1867.....	7,292	13,096	170	207	9,460	19,461	.....	.....	.....	.....	.....	.....	.....	.....	69,565	83,618	153,184	18,619,956 46
1868.....	11,035	14,496	290	245	7,292	15,904	.....	.....	.....	.....	.....	.....	.....	.....	75,957	93,686	169,643	24,010,981 99
1869.....	12,991	11,400	260	200	5,721	12,500	.....	.....	.....	.....	.....	.....	.....	.....	82,859	105,104	187,963	28,422,884 08
1870.....	8,857	8,965	190	142	7,934	8,899	.....	.....	.....	.....	.....	.....	.....	.....	87,521	111,165	198,686	27,780,811 81
1871.....	8,728	6,755	240	178	6,468	7,244	.....	.....	.....	.....	.....	.....	.....	.....	93,394	114,101	207,495	33,077,383 63
1872.....	9,302	6,427	248	120	6,551	4,073	.....	.....	.....	.....	.....	.....	.....	.....	113,954	118,275	232,229	30,165,341 00
1873.....	11,026	5,603	228	151	5,937	3,152	.....	.....	.....	.....	.....	.....	.....	.....	119,500	118,911	238,411	29,185,289 62
1874.....	17,030	5,294	310	178	5,760	4,786	.....	.....	.....	.....	.....	.....	.....	.....	121,628	114,613	236,241	30,593,746 56
1875.....	16,532	5,269	344	130	5,360	4,376	.....	.....	.....	.....	.....	.....	.....	.....	122,969	111,832	234,801	29,683,116 63
1876.....	18,812	5,061	271	97	7,282	3,861	.....	.....	.....	.....	.....	.....	.....	.....	124,239	107,898	232,137	29,351,599 69
1877.....	36,835	9,767	599	131	7,414	3,560	.....	.....	.....	.....	.....	.....	.....	.....	128,123	103,361	231,484	28,580,157 04
1878.....	110,673	25,602	1,361	559	10,176	4,455	.....	.....	.....	.....	.....	.....	.....	.....	138,615	104,140	242,755	33,780,528 19
1879.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	145,410	105,392	250,802	57,240,540 14
1880.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	405,858	274,087	6,601	4,401	168,856	193,494	.....	34,339	40,020	.....	25,470	29,898	705,306	417,718	.....	.....	.....	455,718,505 70



TABLE 5.—Statement of the number of claims for arrears of pension allowed each month from April, 1879, to October, 1880, inclusive, and their distribution among the several pension agencies, with the total amount represented by these settlements.

Months	Boston.	Chicago.	Columbus.	Concord.	Des Moines.	Detroit.	Indianapolis.	Knoxville.	Louisville.	Milwaukee.	New York.	Philadelphia.	Pittsburgh.	Saint Louis.	San Francisco.	Syracuse.	Washington.	Total number allowed.
1879.																		
April.....	43	54	60	41	29	20	41	12	10	34	38	41	32	34	.....	42	48	608
May.....	312	336	362	345	186	188	275	142	92	215	272	287	203	217	.....	342	383	4,167
June.....	531	831	894	456	545	448	755	315	221	439	664	750	456	613	82	592	513	9,035
July.....	442	1,087	1,360	635	696	425	854	348	264	613	594	768	734	742	46	594	707	10,909
August.....	16	114	0	0	12	6	12	41	16	10	12	29	12	12	3	31	19	366
September.....	779	1,180	1,067	855	736	626	1,017	622	409	683	951	1,004	760	869	55	929	727	13,287
October.....	59	97	76	46	37	35	81	55	28	40	63	95	21	48	5	56	97	631
November.....	65	63	80	40	47	30	56	26	16	27	75	50	55	50	3	62	47	820
December.....	39	82	50	39	32	35	62	52	19	25	50	59	28	39	3	44	47	715
1880.																		
January.....	33	52	48	35	39	40	42	87	18	39	42	46	42	45	6	36	41	631
February.....	26	40	47	20	16	24	26	23	14	29	44	42	23	34	4	26	27	404
March.....	25	43	53	20	16	24	24	18	0	15	25	23	16	31	4	25	27	392
April.....	27	35	40	18	26	17	19	13	6	11	19	22	23	18	2	21	20	336
May.....	14	19	21	7	4	10	20	18	9	12	4	13	6	8	17	9	2	108
June.....	30	58	73	36	24	29	60	47	21	25	29	42	24	35	49	20	6	618
July.....	9	18	11	5	5	1	13	5	3	7	6	13	6	5	2	11	11	137
August.....	4	7	4	5	5	5	5	4	3	7	5	5	5	3	.....	6	8	79
September.....	13	4	7	6	5	2	5	4	3	4	4	3	5	6	.....	6	6	83
October.....	11	16	11	8	12	2	11	6	2	6	11	10	6	13	2	6	9	146
Total.....	2,468	4,055	4,367	2,629	2,442	1,965	3,331	1,797	1,100	2,265	2,683	3,325	2,453	2,822	283	2,828	2,765	43,917
Number.	24,680	40,555	43,667	26,290	24,420	19,650	33,311	17,970	11,000	22,650	26,830	33,250	24,530	28,220	283	2,828	2,765	43,917
Value.	\$7,386,490.39	\$13,806,170.52	\$15,052,506.68	\$8,632,632.47	\$7,962,632.47	\$4,962,632.47	\$11,962,632.47	\$6,497,179.49	\$3,917,179.49	\$8,447,179.49	\$10,447,179.49	\$13,447,179.49	\$10,447,179.49	\$13,447,179.49	\$283,179.49	\$2,828,179.49	\$2,765,179.49	\$43,917,179.49

Number and value of arrears allowed from approval of arrears act to June 30, 1879.
 Number and value of arrears allowed from July 1, 1879, to June 30, 1880.
 Number and value of arrears allowed from July 1, 1880, to October 31, 1880.

Total

TABLE 6.—*Unsettled Army pension claims for service since 1861, and the year when filed, also unsettled Navy claims.*

The several years in which the claims were filed.																					Total
1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.			
New England	75	1,681	1,807	833	1,184	903	845	526	479	583	441	392	371	606	817	907	1,371	3,659	11,590	28,470	
	10	170	188	231	392	497	216	357	391	298	240	264	227	225	309	280	1,492	3,865	2,830	28,030	
New York	134	1,748	919	577	918	641	200	261	403	339	487	579	493	752	1,011	1,268	1,807	4,308	14,056	31,501	
	21	290	268	463	410	451	179	102	236	225	215	204	260	253	284	399	602	1,005	8,480	9,427	
Pennsylvania	49	1,335	552	377	503	324	160	225	324	339	376	446	444	527	755	961	1,468	4,457	12,798	26,420	
	9	153	203	316	220	260	120	114	184	203	203	187	189	201	208	242	403	1,062	3,220	7,707	
Ohio	26	779	609	484	658	405	160	271	519	430	457	462	439	537	1,228	1,368	1,596	4,152	13,963	28,563	
	6	162	195	259	210	208	119	140	181	198	183	159	143	155	151	250	337	763	2,481	6,330	
Indiana	56	895	865	552	704	364	217	757	847	537	463	455	563	829	1,968	1,790	2,006	4,006	13,369	31,263	
	4	249	262	425	280	194	90	225	270	218	177	159	208	253	211	307	489	824	2,642	7,534	
Illinois	45	429	443	394	681	410	134	236	528	382	442	229	482	699	1,010	1,092	628	3,260	11,089	22,613	
	4	202	168	199	275	234	110	185	183	161	142	152	174	180	182	192	296	605	2,162	5,906	
Iowa	42	579	445	891	531	367	135	188	252	247	302	398	393	563	953	1,142	1,485	3,036	12,505	24,064	
	6	116	171	194	174	267	108	104	140	152	135	145	141	145	182	208	262	583	2,131	5,364	
Southern	25	338	310	237	464	520	244	353	524	463	573	468	530	716	1,088	1,480	1,941	4,020	11,695	25,939	
	8	206	292	398	594	476	243	325	421	293	301	276	277	290	319	314	875	2,672	8,936	17,633	
Washington	40	569	355	288	510	351	224	366	378	372	361	354	421	508	561	624	881	2,292	8,178	17,033	
	3	92	115	378	637	707	648	1,798	585	403	389	366	479	477	377	880	476	1,043	2,701	12,045	
Total Invalids	492	8,353	5,805	4,133	6,153	4,285	1,819	3,183	4,254	3,692	3,902	3,783	4,136	5,757	9,391	46,602	13,183	33,190	109,933	226,066	
Total widows, &c.	71	1,640	1,862	2,863	3,192	3,294	1,853	3,431	2,901	2,131	1,985	1,912	2,098	2,150	2,223	2,594	3,668	7,755	24,319	71,631	
Aggregate	563	9,993	7,667	6,996	9,345	7,579	3,652	6,614	6,555	5,823	5,887	5,695	6,234	7,916	11,614	13,196	16,851	40,945	134,272	307,697	

There are also 3,897 Navy widows distributed over the same periods in about the same proportions. Twenty-one hundred and fifty-eight old war invalids and 170 old war widows, &c., on the files are distributed through many years before and since 1862.

SUPPLEMENT TO TABLE 6.—Army invalid pension claims (for service since 1861) allowed each year since 1871, showing the several years in which they were filed.

The several years in which the claims were allowed, and number allowed.										
Years in which the claims were filed.										
	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.
1862.....	14	8	6	10	7	5	7	4	4	15
1863.....	222	141	90	125	133	107	180	124	130	259
1864.....	215	141	80	105	110	74	128	102	103	222
1865.....	344	206	128	112	98	83	113	123	95	179
Total to July 1, 1865.....	795	495	322	352	353	260	378	363	332	675
1866.....	657	334	255	222	165	138	172	184	139	245
1867.....	638	361	254	158	145	100	128	130	91	104
1868.....	416	242	190	126	84	43	104	54	47	100
1869.....	1,159	465	295	179	148	129	104	81	67	84
1870.....	2,629	1,641	758	448	270	182	205	140	103	283
Total to July 1, 1870.....	6,294	3,538	2,083	1,483	1,165	861	1,041	953	779	1,520
1871.....	1,268	1,947	1,094	441	298	290	182	128	97	219
1872.....	.....	1,447	2,436	821	436	290	277	203	139	258
1873.....	.....	.....	746	1,763	694	353	427	250	145	260
1874.....	.....	.....	.....	1,823	1,867	669	516	262	173	330
1875.....	.....	.....	.....	.....	1,060	2,199	1,192	504	278	430
1876.....	.....	.....	.....	.....	.....	582	2,655	1,892	617	765
1877.....	.....	.....	.....	.....	.....	.....	786	2,314	1,478	1,090
1878.....	.....	.....	.....	.....	.....	.....	.....	2,585	1,820	5,815
1879.....	.....	.....	.....	.....	.....	.....	.....	794	2,731	3,545
1880.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	310
Total.....	7,562	5,922	6,359	5,331	5,520	5,144	7,066	7,285	7,073	9,723
Total.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	67,015

TABLE 7.—*Number of claims of each class, respectively, filed, admitted, and rejected during the year, and comparative condition of the files at the beginning and close of the year.*

For the year ending June 30, 1880.	Army.						Navy.				Total Army and Navy.	War of 1812.			Aggregate of all classes.				
	Invalids.			Widows, &c.			Invalids.		Widows, &c.			Original.							
	Original.	Increase.	Total.	Original.	Increase.	Total.	Original.	Increase.	Total.	Original.		Increase.	Total.	Survivors.		Widows of, &c.	Restoration.		
Number of claims on the files June 30, 1879	137,416	6,524	143,940	50,453	358	50,811	2,757	80	2,837	1,150	1	1,151	198,739	8,974	11,589	20,563	219,302		
Number of new claims filed during the year	116,673	24,272	135,045	25,602	792	26,394	1,361	230	1,591	559	14	573	1,341	164,944	295	2,976	3,307	168,251	
Number of claims admitted	9,865	8,917	18,782	4,254	280	4,534	311	74	385	201	15	216	1,841	25,258	284	4,630	36	4,950	
Number of claims rejected	2,343	10,904	13,247	1,322	30	1,352	187	88	275	113	...	113	14,987	562	1,567	...	2,129	17,116	
Total number of claims settled	12,208	19,821	32,029	5,576	310	5,886	498	162	660	314	15	329	1,341	40,245	846	6,197	36	7,079	47,824
Number of claims on the files June 30, 1880	238,224	11,075	249,299	71,801	840	72,641	3,807	148	3,955	1,508	...	1,508	...	327,403	8,885	9,935	...	18,920	346,323
Increase in number during the year	100,808	4,551	105,359	21,348	482	21,830	1,050	68	1,118	358	...	357	...	128,664	11	...	...	...	127,021
Decrease in number during the year											1	...	...	...	1,654	...	...	...	1,643

There were received during the year 12,770 formal claims for arrears of pensions. Arrears was allowed during the year in 29,662 cases, and denied in 84,412 cases of formal application, and in many others which cannot be easily determined.

There were received during the year 578 applications for bounty-land warrants; 191 warrants were issued, 381 applications were rejected, and there remained 2,469 claims pending at the close of the year.

The class "widows, &c.," of the Army and Navy, includes widows, minor children, dependent mothers, dependent fathers, and orphan brothers and sisters.

TABLE 8.—Number of claims of each class filed [month by month from January, 1879, to October, 1880, inclusive, together with the average number per month for two periods of 6 and 12 months preceding.

	Number of claims of all classes filed.									
	Army and Navy.					War of 1812.		Bounty land.	Total war of 1812 and bounty land.	Total number of claims filed.
	Invalids.	Widows, &c.		Total Army and Navy.		Survivors.	Widows of, &c.			
	Original.	Increase.	Original.	Increase.	Arrests.					
Average per month for year ending June 30, 1878.	1,592	1,841	506	44	.....	232	1,325	24	1,581	5,024
Average per month for six months ending December 31, 1878.	1,057	1,237	464	42	.....	88	1,025	68	1,181	4,011
Filed in January, 1879.	1,403	1,399	468	45	420	53	295	179	527	4,262
February, 1879.	2,125	1,313	759	23	23,372	33	3,735	206	748	28,340
March, 1879.	4,367	1,820	1,196	33	22,472	33	29,898	124	698	30,596
April, 1879.	11,610	1,593	1,511	42	8,574	33	23,330	84	656	23,986
May, 1879.	4,855	1,322	1,651	47	4,483	33	12,338	54	556	12,914
June, 1879.	6,552	1,843	1,612	33	4,051	33	14,091	87	570	14,661
July, 1879.	5,121	1,695	1,408	51	1,638	33	10,174	70	511	10,685
August, 1879.	6,202	1,318	1,468	54	1,992	33	11,034	89	397	11,431
September, 1879.	5,548	2,277	1,566	43	2,147	33	11,581	56	476	12,057
October, 1879.	5,468	2,321	1,669	26	1,158	33	10,642	267	49	11,014
November, 1879.	8,100	2,000	2,050	2	1,278	33	12,453	16	226	12,679
December, 1879.	10,098	2,540	1,920	30	1,172	33	15,700	20	276	16,036
January, 1880.	8,034	2,169	1,853	191	901	33	13,148	10	245	13,393
February, 1880.	5,058	2,063	1,204	78	416	33	9,349	12	193	9,542
March, 1880.	6,192	3,018	1,527	84	451	33	11,272	52	271	11,543
April, 1880.	7,150	2,142	1,990	204	292	33	11,778	12	264	12,042
May, 1880.	8,176	1,688	1,800	125	283	33	12,082	174	213	12,295
June, 1880.	86,867	3,008	7,645	69	832	33	48,441	26	405	48,846
July, 1880.	2,900	2,229	76	76	247	33	6,362	12	385	6,532
August, 1880.	1,320	1,119	1,030	27	179	33	3,362	16	200	3,540
September, 1880.	1,006	1,181	717	27	83	33	8,596	18	170	8,766
October, 1880.	1,896	1,902	586	10	62	33	8,416	35	163	8,579

TABLE 9.—Investigation of frauds—expenses and savings.

For the fiscal year ending June 30, 1880.				
	No. of investi- gations made.	Gross sav- ings.	Expenses.	Future annual sav- ings.
Cases of pensioners.				
Pending claims.....	371			
Miscellaneous matters, criminal acts, attorneys, &c.....	539			
Amount due and unpaid 156 pensioners whose names were dropped after investigation.....	74			
Accrued pension in 285 claims <i>prima facie</i> established, rejected after investigation.....		\$32,180 31		
Money illegally drawn as pensions and refunded.....		371,081 84		
Expenses of special agents, subsistence.....		23,563 50		
Expenses of special agents, travel, &c.....		\$15,002 00		
Amount of one year's pension in cases dropped from the rolls.....		10,804 19		
Amount of one year's pension in cases rejected.....				\$19,602 00
Annual reduction in rates of 37 pensions.....				37,000 00
				8,189 00
Total.....	1,084	451,775 65	30,460 19	50,967 00
Attorneys: Suspended, 40; debarred, 18; dropped, 23; restored, 24. (Criminal prosecutions: Cases submitted, 96 [attorneys 30, and other persons 66]; indictments, 23; convictions, 30 [attorneys 13, and other persons 17]; acquittals, 18; not prossed, 2; no bills, 9; juries disagreed, 1; dismissed, 21; awaiting action, 150.				
Number of claims in the investigation files July 1, 1879.....		1,004		
Number of claims in the investigation files July 1, 1880.....		248		
Decrease during the year over receipts.....		<u>756</u>		
Number of claims in the correspondence files July 1, 1879.....		686		
Number of claims in the correspondence files July 1, 1880.....		601		
Decrease during the year over receipts.....		<u>85</u>		

TABLE 10.—*List of pension agencies, with location, geographical limits, and name of pension agents, showing the balance of funds in the hands of each agent June 30, 1880.*

Location of agency.		Name of agent.		Amount.		Geographical limit.
City.	State.			Army.	Navy.	
Boston.....	Massachusetts	D. W. Gooch.....		\$143 64	\$303 53	The States of Massachusetts, Connecticut, and Rhode Island.
Chicago.....	Illinois	Ada C. Sweet.....		1,082 49	72 34	The State of Illinois.
Columbus.....	Ohio	A. T. Wilkoff.....		4,316 36	337 77	The State of Ohio.
Concord.....	New Hampshire	E. L. Whitford.....		1,119 58	1,331 84	The States of Maine, New Hampshire, and Vermont.
Des Moines.....	Iowa	B. F. Gue.....		527 98		The States of Iowa and Nebraska.
Detroit.....	Michigan	Samuel Post.....		5,526 16	1,147 42	The State of Michigan.
Indianapolis.....	Indiana	Fred. Kuefler.....		146,592 87		The State of Indiana.
Knoxville.....	Tennessee	D. T. Boynton.....		5,165 60	381 80	The States of Virginia, West Virginia, North Carolina, Tennessee, Arkansas, Mississippi, Louisiana, Alabama, Georgia, Florida, South Carolina, and the Indian Territory.
Louisville.....	Kentucky	R. M. Kelly.....		91,453 69	671 20	The State of Kentucky.
Millwaukee.....	Wisconsin	Edward Ferguson.....		2,118 59	29 38	The States of Wisconsin and Minnesota and the Territories of Dakota, Montana, and Wyoming.
New York City..	New York	Charles R. Coster.....		197,946 98	2,186 52	The counties of Albany, Clinton, Columbia, Delaware, Dutchess, Essex, Greene, Kings, Queens, New York, Orange, Putnam, Richmond, Rensselaer, Rockland, Saratoga, Schenectady, Sullivan, Suffolk, Ulster, Warren, Washington, and Westchester.
Philadelphia.....	Pennsylvania	H. G. Sickel.....		13,456 55	179 47	The counties of Berks, Bradford, Bucks, Carbon, Chester, Columbia, Dauphin, Delaware, Lancaster, Lebanon, Lehigh, Luzerne, Lackawanna, Monroe, Montgomery, Montour, Northampton, Northumberland, Philadelphia, Pike, Schuylkill, Sullivan, Susquehanna, Wayne, Wyoming, and York.
Pittsburgh.....	do	W. A. Herron.....		2,020 75	166 36	The counties in the State of Pennsylvania not in the Philadelphia district.
Saint Louis.....	Missouri	Rufus Campion.....				The States of Missouri, Kansas, and Colorado, and the Territory of New Mexico.
San Francisco.....	California	W. H. Payne.....		2,790 26	108 38	The States of California, Nevada, and Oregon, and the Territories of Idaho, Washington, Arizona, and Utah.
Syracuse.....	New York	T. L. Poole.....		17,865 34	683 72	The counties in the State of New York not in the New York City district.
Washington.....	District of Columbia	J. S. Wither.....				The States of New Jersey, Delaware, Maryland, the District of Columbia, and all the national home and foreign pensioners.
				494,126 86	7,598 73	

REPORT OF THE COMMISSIONER OF PATENTS.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., December 1, 1880.

SIR: I have the honor to submit the following as a summary of the business of the Patent Office for the fiscal year ending June 30, 1880:

Number of applications for patents for inventions	20,990
Number of applications for patents for designs	681
Number of applications for reissues of patents	598
Number of applications for extensions	0
Number of caveats filed	2,680
Number of applications for registration of trade-marks	732
Number of applications for registration of labels	479
Number of disclaimers filed	11
Number of appeals on the merits	781
Number of inventions granted	12,584
Number of patents for designs granted	569
Number of reissues granted	496
Number of patents extended	0
Number of trade-marks registered	515
Number of labels registered	307
Number of patents withheld for non-payment of final fee	1,313
Number of patents expired	3,364

Statement of moneys received.

On behalf of applications for patents, caveats, disclaimers, appeals, and trade-marks	\$642,335 00
On behalf of applications for copies	55,135 44
On behalf of applications for assignments	22,341 35
On behalf of subscriptions to Official Gazette	8,635 33
On behalf of registration of labels	2,100 00
Total	730,547 12

Statement of moneys expended.

On behalf of salaries	\$406,958 99
On behalf of contingent expenses	34,997 80
On behalf of Gazette	27,292 17
On behalf of tracings	4,680 00
On behalf of copies of drawings (photolithographing back issues)	24,998 44
On behalf of photolithographing current issues	34,999 16
On behalf of scientific library	4,999 87
Total expenses	538,926 43
Receipts above expenses	\$191,620 69

The receipts for the past fiscal year exceed those of the preceding year \$27,407.33, while the expenditures were \$9,725.04 less, making a net

gain in the excess of receipts over expenditures of \$37,125.37. The increase of receipts is due to the larger number of applications for patents, &c.

There have been about 235,000 patents for inventions, and 12,000 patents for designs, granted by this office since January, 1837. These patents are included in 145 classes of inventions, which are grouped according to their kindred character in 24 divisions, each division being under the jurisdiction of a principal examiner.

As applications are filed in this office they are jacketed or inclosed in a file wrapper, and then distributed to one of the principal examiners, according to the invention, for examination in the first instance.

The 20,990 applications for patents, 681 applications for designs, 598 applications for the reissue of patents, 732 applications for registration of trade-marks, and the 479 applications for the registration of labels, making in all 23,480 applications, make an average of about 1,000 original applications for each examiner to dispose of. To do this an examination of voluminous records, and of all patents in this and foreign countries belonging to the same class, must be made to ascertain whether the applicant is entitled to a monopoly of the invention for which he claims a patent.

After furnishing the applicant with information which, in the opinion of the examiner, should defeat the grant, said applicant may either amend his application or demand a reconsideration of the decision. As a rule the applications are amended, and, as they may be amended as often as new reasons and references are given by the examiner, which, by reason of the change in the claims, often becomes necessary, it is not extravagant to say that the average actions, each of which amounts to a decision upon evidence, which the examiner must himself find, is not less than four to each application. The fact that not less than 4,000 decisions, judicial in their character, must be made annually by each examiner, gives some conception of the labor imposed upon the examining force of this office.

Notwithstanding the examining force of this office is composed of persons of superior ability and industry, the work in some of the divisions is in arrears from two to four months. This is a cause of much complaint from inventors, who are, as a rule, impatient of delays.

I have attempted to remedy this evil as far as practicable, by drawing from the clerical force, itself quite limited, such of the best clerks as could possibly be spared, and assigning them to duty with the different examiners. There are now 27 clerks employed in this way doing duty in kind the same as third assistant examiners, and some of them are doing as much and of the same quality as third assistants. Because of the great need of increase of force and facilities in the examining corps I submitted estimates for some increase therein and for a sufficient number of clerks of class one to enable me to continue the assignment of at least one clerk of that grade to each examiner.

I have to say that the entire force in this office, so far as I have been able to ascertain, is industrious, and is deserving of commendation for fidelity and attention to duty. There are many persons on the rolls doing duty in a grade much above that for which they are receiving pay, the appropriation for salaries being entirely inadequate to the necessities of the office. My predecessor was compelled to employ a considerable number of persons beyond those provided for in the appropriation. In order to do this the salaries of a large number must be below that which is contemplated by Congress for a given character of service. I found the office in this condition and have refrained from

making any change, for the reason that the entire number on the rolls is needed for the transaction of the business of the office. Indeed, the number is actually inadequate for the performance of all the work that should be done for the proper arrangement and protection of a vast amount of most valuable material in the office and to give the greatest practical convenience to the public. I have, however, suggested and provided for a remedy for this defect in my estimates for the fiscal year ending June, 1882, and have the honor to request that in furtherance thereof you will make such recommendation as shall, in your judgment, be deemed expedient and appropriate.

I desire to secure your earnest attention and consideration to the great necessity for a system of digests of inventions for the use of this office and of the public. There should be arranged and classified and briefly described the inventions included in nearly 240,000 patents in this country, a large number of patents in foreign countries, as well as the inventions disclosed in publications, technical works, and the reports of scientific and other societies. If correct and thorough digests of this character, from the organization of the office down to the present time, were in the hands of the examiners and the inventors and attorneys practicing before the office, the examining corps would bear some reduction, unless the number of applications should be largely increased, instead of requiring augmentation, as is now the case. In many of these classes a sufficient number of volumes could be sold to reimburse the government for the entire expense of publication. Such digests would therefore be economical, and secure far greater accuracy in the granting of patents.

Another matter to which I invite your attention is the necessity of additional room for the use of this office. The want of adequate room for the examining corps largely diminishes the effective force of the examining officers. Mr. Commissioner Paine, on this subject, in his annual report for the last fiscal year, said :

The rooms occupied by the examiners are utterly inadequate to the requirements of the public service. Many of them are too unhealthy to be fit for any use except the storage of material. Each of the examining divisions needs two well-lighted and well-ventilated rooms. But, in most cases, a single small room is the only accommodation afforded for the entire examining division, including the clerks, with all the desks, models, drawings, and books required for the performance of their work. It necessarily results that each examiner is disturbed by the consultations of the other examiners with inventors and attorneys.

The crowded condition of the rooms retards the transaction of business, and at the same time occasions much sickness as well as discomfort among the examiners and clerks. This entails serious loss upon the government and involves gross injustice to these officers. The government has already levied upon the inventors contributions nearly equal to the cost of the Patent Office building. In the original statute providing for its erection, which was enacted July 4, 1836, it was ordered that the cost should be "paid out of the patent fund in the Treasury not otherwise appropriated." This would seem to have indicated at the outset all the net revenues realized by the government from the Patent Office to the construction of the building.

In 1849 and 1850 specific appropriations of the patent fund were made for the construction of this edifice, amounting to \$260,000. In addition, the government has taken from inventors enough to make the aggregate net revenues from the Patent Office almost a million and a half of dollars; and yet this bureau is now restricted to a small part, which is also the worst part of the building, and the best portions are being occupied by the Land Office, the Indian Bureau, the Assistant Attorney-General, and the offices of the Secretary of the Interior. The Patent Office needs and ought to have exclusive possession of the entire building, excepting only those portions required for the use of the Secretary.

Seasonable legislation looking to that end is imperatively required, but meantime some temporary expedient must be devised to increase the room at the disposal of this bureau. I recommend as one of the expedients the adaptation of a part of the third story of the west and north wings of the Patent Office to the present use of this bureau,

by the construction of temporary partitions which shall not in any way interfere with the plan adopted for the reconstruction of those wings, and that one or more elevators be constructed from the basement to the third story of the building.

The latter part of this recommendation has in some measure been consented to, and a room is now provided for the copying and assignment divisions, which is ready for occupancy with the exception of suitable and sufficient heating apparatus. When that is provided I will be enabled to bring the copying division into this building. This, however, does not provide for additional room for the examiners, so necessary to the proper dispatch of business; and I trust, the reasons being so urgent, you will at an early day bring to the attention of Congress the difficulties under which the officers of this bureau labor, to the end that suitable rooms may be provided.

I am, sir, very respectfully, your obedient servant,

E. M. MARBLE,
Commissioner.

HON. CARL SCHURZ,
Secretary of the Interior.

REPORT

OF

THE SUPERINTENDENT OF CENSUS.

DEPARTMENT OF THE INTERIOR, CENSUS OFFICE,
Washington, D. C., December 1, 1880.

SIR: I have the honor to present the annual report of the operations of this Bureau:

During the year closed, the Tenth Census of the United States has been taken.

Although the work is substantially complete, returns having been received from all but seven small districts,* out of the total number of 31,265 enumeration districts formed for the purpose of the census, it will probably be two or three weeks yet before this Office will be able to present the complete statistics of the population of the country; and it seems best, therefore, to postpone to a future report all mention of the results of the enumeration, and also all discussion of the methods in use, as well as any suggestions which may require to be made of changes in the census law with reference to future enumerations. I trust during the present month to be able to submit a full account of the working of the acts of March 3, 1879, and April 20, 1880, which were passed with reference to the recent enumeration, together with tables exhibiting the population of each State and county, distinguished as native or foreign, white or colored, male or female.

On the 1st of December, 1879, the force of this Office consisted of 44 persons, clerks and other employés. This force was occupied partly in making preparations for the approaching June enumeration of the population, and partly in conducting certain inquiries relating to the census year (the twelve months ending May 31, 1880,) then current, especially inquiries concerning the mortality of the different sections of the United States; concerning the fishing, mining, and grazing industries of the country; and concerning the social conditions of our city populations.

The following table exhibits the total number of employés of the Office on the 1st of each month succeeding, including May:

	Number of employés.	Amount of pay- roll for pre- ceding month.
January 1, 1880	48	\$3, 219 54
February 1, 1880	58	4, 097 30
March 1, 1880	77	4, 589 87
April 1, 1880	86	5, 479 32
May 1, 1880	121	6, 259 58

* Of these, one is in Texas, one in Wisconsin, one in Michigan, two in Maryland, one in Iowa, and one in Dakota.

The approach of the June enumeration required a considerable increase of the force of the Office, and as soon as the first schedules were received, in July, from the supervisors of the several districts, the force was rapidly increased to secure the earliest possible revision of the schedules, prompt payment of the enumerators for their services, and an immediate commencement of the work of compilation in the several divisions of the Office. The following table exhibits the aggregate number of employes on the 1st of each month from June to December, inclusive:

	Number of employes.	Amount of pay- roll for pre- ceding month.
June 1, 1880.....	245	\$11, 669 25
July 1, 1880.....	263	14, 512 55
August 1, 1880.....	448	21, 880 55
September 1, 1880.....	737	35, 992 71
October 1, 1880.....	873	45, 411 93
November 1, 1880.....	1, 015	54, 564 28
December 1, 1880.....	1, 084	60, 256 03

The exigencies of the service ever since the 1st of May have required a considerable clerical force to be maintained upon work at night.

It is the view of the Superintendent that the compilation and publication of the several classes of statistics, should be pushed forward with the utmost expedition.

While the census will always remain of value for purposes of comparison with preceding periods, the first and greatest use of the census is its immediate use, not only for determining the distribution of political power, according to the provisions of the Constitution, but also for directing State and National legislation, and for guiding individual and social effort for the promotion of public interests, and for the amelioration of the condition of the criminal, afflicted, and dependent classes.

Every year and every month, therefore, which can be saved in the compilation and publication of the census statistics, adds appreciably to their value. I will not say that the country could well afford to pay largely for thus hastening the promulgation of the results of the census, but, rather, that the country could on no account afford to allow any delay therein beyond the time absolutely necessary to secure careful revision and a correct compilation of those results. In fact, however, when the saving of the general expenses of the Office is taken into account, a prompt compilation and an early publication of the census statistics secure an actual economy of expenditure. In this view, the work of this Office will be pressed forward with the utmost energy, until it is brought to a full completion. And, in order to attain the earliest practicable publication of results, I have the honor to recommend that Congress be asked to authorize the printing, by special contract, under the supervision of the honorable Secretary of the Interior (and if it be thought desirable, also, of the Printing Committees of the two Houses of Congress), of the several reports of the census, as fast as prepared.

With the enormous pressure upon the Public Printer, where every government service is clamoring for early action upon its own work, and where requisitions of weeks' if not of months' standing, must have priority to the census reports, a great saving of time could undoubtedly be effected by the adoption of the foregoing recommendation.

Several important reports will be ready for publication during the course of this winter, and I cannot but think that it would afford much

gratification to the country if they could be pushed through the press with all the expedition which belongs to private enterprise, when time is made of the essence of the contract, as in this case it should be.

In addition to the several special investigations set on foot during the year 1879, as mentioned in the last annual report of this Office, the following important departments have also been assigned to Special Agents for investigation, under the provisions of the eighteenth section of the act of March 3, 1879, and the eighth section of the act of April 20, 1880.

Robt. P. Porter, Esq., Statistics of Wealth, Debt, and Taxation.

Dr. Henry Randall Waite, Statistics of Churches, Schools, and Libraries.

Maj. Jno. W. Powell, Social and Industrial Statistics of the Indian Tribes.

Ivan Petroff, Esq., Population, Industry, and Resources of Alaska.

S. N. D. North, Statistics of Newspapers and Periodicals, and of the Book-Publishing Interest.

Col. J. B. Killebrew, Statistics of the Tobacco Culture.

Wm. L. Rowland, Esq., The Chemical Manufacturing Industries.

Henry Hall, Esq., Ship-building.

Prof. S. F. Peckham, Statistics of Petroleum Production.

George W. Hawes, Ph. D., Statistics of the Quarrying Industry.

Col. Carroll D. Wright, The Factory System.

With the exception of the last four investigations, which have but recently been set on foot, the work has in each progressed so far as to give assurance of a very marked degree of success to result from the use of the appropriate agencies authorized by the enlightened provisions of the sections referred to.

The authority conferred by the eighteenth section for the appointment of special agents to collect the Manufacturing Statistics of cities and considerable towns has been made use of by this Office to the extent of appointing such agents in 276 cities and towns, the total number of agents appointed being 365. From 260 of these cities and towns full returns have been already received, and an examination of the schedules shows that the value of the manufacturing statistics of the present census has been vastly enhanced by the system thus adopted.

In the remaining sixteen, embracing the largest cities of the country, from which returns, on account of the great number of establishments to be canvassed, are not yet fully due, the work is, according to full and frequent advices received at this Office, progressing in the most satisfactory manner. All the returns within this department of the census will, it is believed, be in possession of this Office during the present month, when the compilation of the manufacturing statistics will be pushed rapidly forward.

The work of paying the enumerators for their services has been carried on with the utmost expedition which was consistent with justice to the Census and to the Treasury.

It has been necessary to ascertain that each part of the enumerator's work has been properly done before he could safely be paid, and it has also been necessary to guard each statement and payment of account with all the checks which would have been necessary in case of much larger payments. The accounts of 28,410 enumerators have already been stated and settled, involving a total expenditure of \$1,820,027.34; of the remaining 2,855 cases, the accounts of 1,242 have been stated, and vouchers have been mailed to the enumerators for their signature. In 1,199 cases the accounts are now in course of adjustment. In 414 cases accounts have been suspended, owing to deficiencies or irregularities in returns

or to the failure of supervisors to make the required statements of time occupied or work done, or to the necessity of still further investigating matters connected with the enumeration. I have no reason to doubt that the present month will see all the enumerators paid for their services, except only in cases where a suspension is required, for reasons which are unmistakably connected with some fault, more or less serious, on the part of the enumerator himself.

The total disbursements on account of the Tenth Census to December 1, 1880, are as follows:

Supervisors of census:		
Salaries	\$53,000 00	
Clerk hire and miscellaneous	54,801 12	
		\$107,801 12
Enumerators		1,820,027 34
Special agents for the collection of the manufacturing statistics of individual cities:		
Salaries	\$39,607 93	
Office rent and miscellaneous	3,825 66	
		43,433 59
Special agents at large for the collection of industrial and social statistics:		
Salaries	82,435 82	
Clerk hire	48,777 40	
Traveling expenses	55,733 01	
Office rent and miscellaneous	16,903 66	
		203,849 89
Census Office:		
Salaries	288,708 84	
Rent and fuel	5,769 55	
Furniture and fittings	25,942 09	
Stationery	24,464 12	
Printing and binding	63,310 33	
Traveling expenses and miscellaneous	8,750 42	
		416,945 35
Total		2,592,057 29

An acknowledgment of the services of the Supervisors of the several districts will more appropriately form a part of the report soon to be made upon the results of the census and the actual workings of the census law, as tested in the recent enumeration.

But I cannot deny myself the pleasure of anticipating that occasion so far as to say that the very difficult and critical duties of that office have been discharged, with but inconsiderable exceptions, in a manner most satisfactory. The zeal, energy, and prudence displayed by these officers, their provision against the accidents of enumeration, and their intelligent comprehension of the wants of their districts, entitle them to the highest commendation.

In but three cases has it been found necessary to use the authority conferred by the twenty-third section of the act of March 3, 1879, for the removal of supervisors and the appointment of their successors, and in neither of these cases were the causes requiring removal such as to reflect upon the personal or official integrity of the supervisor so removed.

I have the honor to be, very respectfully, your obedient servant,
FRANCIS A. WALKER,
Superintendent of Census.

HON. CARL SCHURZ,
Secretary of the Interior.

REPORT
OF THE
UNITED STATES INSPECTOR OF GAS AND METERS.

OFFICE UNITED STATES INSPECTOR OF GAS AND METERS,
NO. 403 TENTH STREET,
Washington, D. C., September 15, 1880.

SIR: I have the honor herewith to submit the annual report of this office, showing its operations for the fiscal year ending June 30, 1880. At its commencement will be found condensed tables giving the illuminating power and purity of the gas furnished by the gas companies during the year. Full monthly statements will be found in tables A and B. In the remaining tables, lettered C, D, E, and F, the monthly inspection of meters, the pressure of the gas, and the receipts and expenditures are fully stated.

Very respectfully, your obedient servant,

S. CALVERT FORD,
Inspector of Gas and Meters.

Hon. C. SCHURZ,
Secretary of the Interior.

ILLUMINATING POWER AND PURITY.

The illuminating power and purity of the gas supplied by the Washington Gas-Light Company from July 1, 1879, to June 30, 1880:

Average illuminating power during the year, 16.88 candles.

Highest illuminating power during the year, 19.46 candles.

Lowest illuminating power during the year, 12.39 candles.

Average quantity of ammonia in 100 cubic feet during the year, 1.43 grains.

Highest quantity of ammonia in 100 cubic feet during the year, 5.01 grains.

Lowest quantity of ammonia in 100 cubic feet during the year, .20 grain.

Average quantity of sulphur in 100 cubic feet during the year, 10.76 grains.

Highest quantity of sulphur in 100 cubic feet during the year, 26.03 grains.

Lowest quantity of sulphur in 100 cubic feet during the year, 4.11 grains.

On various occasions during last fall the light obtained from the gas was dull and poor-looking, particularly in low sections of the city.

According to the instruments used for determining the illuminating power and pressure of the gas in this office the cause of these depressions was not owing in very many instances to a poor quality of gas, but was

to a considerable extent produced by deficient pressure and the presence of naphthaline in the service pipes. The latter is a great nuisance, and baffles the skill and ingenuity of the most competent gas engineers to prevent its formation.

Naphthaline is a hydrocarbon which condenses from the gas in its passage through the mains; crystallizing, it chokes up the services, and in some localities prevents entirely the flow of gas. The cause for deficient light and low pressure in a number of instances can be attributed to the existence of this compound in the gas.

On seventeen occasions during the year the gas supplied by this company was of less illuminating power than sixteen candles, as follows: July 15, 15.53 candles; July 16, 12.39 candles; September 4, 15.82 candles; September 6, 15.75 candles; September 12, 15.01 candles; September 17, 15.85 candles; October 10, 15.30 candles; October 11, 15.88 candles; October 15, 15.57 candles; November 10, 15.86 candles; November 11, 15.95 candles; November 13, 15.86 candles; November 17, 15.78 candles; November 18, 15.76 candles; November 26, 15.59 candles; December 5, 15.81 candles; January 7, 15.97 candles.

It will be observed that on one occasion the gas was below fifteen candles. The depression was caused by the admission of air in the crown of a gasometer whilst being repaired.

On six occasions the gas of this company contained a slight excess of sulphur over the 20 grains allowed in each 100 cubic feet: September 30, 21.09 grains; October 1, 20.27 grains; October 7, 20.16 grains; October 8, 26.03 grains; October 9, 20.82 grains; January 19, 21.09 grains.

The illuminating power and purity of the gas supplied by the Georgetown Gas-Light Company from July 1, 1879, to June 30, 1880:

Average illuminating power during the year, 16.84 candles.

Highest illuminating power during the year, 19.29 candles.

Lowest illuminating power during the year, 13.89 candles.

Average quantity of ammonia during the year in 100 cubic feet, 1 grains.

Highest quantity of ammonia during the year in 100 cubic feet, 12.85 grains.

Lowest quantity of ammonia during the year in 100 cubic feet, .27 grain.

Average quantity of sulphur during the year in 100 cubic feet, 10.78 grains.

Highest quantity of sulphur during the year in 100 cubic feet, 17.67 grains.

Lowest quantity of sulphur during the year in 100 cubic feet, 1.37 grains.

On twenty-five occasions during the year the gas supplied by this company was of less illuminating power than sixteen candles, as follows: July 9, 15.94 candles; July 14, 15.58 candles; August 22, 15.06 candles; September 1, 15.12 candles; September 8, 15.80 candles; September 11, 15.94 candles; October 6, 15.27 candles; October 9, 15.42 candles; October 31, 15.79 candles; November 6, 15.96 candles; November 8, 15.55 candles; November 10, 15.61 candles; November 11, 15.78 candles; November 13, 15.36 candles; December 24, 13.89 candles; December 27, 15.81 candles; January 31, 15.95 candles; February 5, 14.69 candles; March 27, 15.95 candles; March 30, 14.56 candles; May 19, 15.50 candles; May 27, 15.52 candles; June 11, 15.82 candles; June 12, 15.72 candles; June 14, 15.75 candles. On three evenings, namely, December 24, February 5, and March 30, the power was less than fifteen candles.

From June 27 to August 9, inclusive, the gas supplied by this company contained a larger per cent. of ammonia than allowed, the excess being from two to seven grains each day over the lawful quantity, five grains in each one hundred cubic feet. This excess of ammonia could not have been prevented by ordinary care and prudence, but was occasioned by some unavoidable cause.

GAS-BURNERS

The burner required by law to be used in determining the illuminating power of the gas in this District is generally known as the Sugg-Letheby, or Old Parliamentary, Argand burner, having fifteen holes and a seven inch chimney, consuming five cubic feet per hour, and the luminosity derived from this stated consumption must equal in intensity the light emitted by sixteen sperm candles, each burning at the rate of 120 grains per hour.

During the months of January, February, and March, last, a series of tests were made with burners ordinarily used in general illumination. The object in view, in making the experiments, was to ascertain whether the burners used by consumers furnished the same luminosity for equal consumption of gas as the standard Argand, described above. Tests were made also with London Argands, manufactured by William Sugg, of Westminster, and the Silber burner, made by Silber Light Company, London.

Description of burner.	Number of tests.	Pressure at point of ignition.	Actual consumption of gas per hour.	Illuminating power in candles, at rate of actual consumption.	Illuminating power in candles, at rate of 5 cubic feet per hour.	Value of 1 foot gas, in candles.
		Inch.	Cub. feet.	Candles.	Candles.	Candles.
Brass burner, fish-tail, 3-foot.....	1*	.60	2.81	4.79	10.35	2.07
Brass burner, fish-tail, 4-foot.....	2*	.60	2.95	7.99	13.54	2.70
Brass burner, fish-tail, 5-foot.....	3*	.60	4.05	13.17	16.25	3.25
Lava-tip burner, bat-wing, 2-foot.....	4†	.60	2.85	8.08	14.17	2.83
Lava-tip burner, bat-wing, 3-foot.....	5†	.60	3.30	11.64	17.63	3.52
Lava-tip burner, bat-wing, 4-foot.....	6†	.60	3.51	12.45	17.70	3.54
Lava-tip burner, bat-wing, 5-foot.....	7†	.60	3.93	14.50	18.55	3.71
Sugg-Letheby Argand, 15 holes, 7-inch chimney.....	8†	.05	5	17.17	17.17	3.43
Sugg's G Argand, 33 holes, 8-inch chimney.....	9§	.25	5	20.77	20.77	4.16
Ellis lava-tip, bat-wing, 5-foot.....	10||	.50	5	20.32	20.32	4.06
Sugg-Letheby Argand, 15 holes, 7-inch chimney.....	11:	.05	5	17.63	17.63	3.52
Lava-tip burner, fish-tail, 6-foot.....	12||	.60	18.87	18.87	18.87	3.77
Sugg's G Argand, 33 holes, 8-inch chimney.....	13§	.255	5	21.54	21.54	4.30
Empire lava-tip, bat-wing, 5-foot.....	14||	.40	4.13	16.52	20.00	4.00
Sugg's F Argand, 30 holes, 7-inch chimney.....	15§	.225	5	20.42	20.42	4.08
Sugg-Letheby Argand, 15 holes, 7-inch chimney.....	16:	.05	5	17.70	17.70	3.54
Silber's Argand, 24 holes, 9-inch chimney.....	17§	.05	5	20.51	20.51	4.10
Sugg's E Argand, 27 holes, 7-inch chimney.....	18§	.225	5	21.02	21.02	4.20
Sugg-Letheby Argand, 15 holes, 7-inch chimney.....	19:	.05	5	17.56	17.56	3.51

* Poor and extravagant.

† Best where small flame is required.

: Standard Argand.

§ Excellent where a soft and steady light is needed. Very economical.

|| Good and economical for general use.

The foregoing tests very clearly demonstrate the great loss of light, and consequent waste, in consumption of gas, where burners with small openings are used, particularly where the tips are of metal and of the fish-tail form. Burners of this description, consuming from two to four cubic feet per hour, are very generally in use, with and without globes, and it is not at all surprising that complaints should be made of poor light

where such conditions exist. Twenty to forty per cent. of luminosity is not an uncommon loss, and in cases where globes or shades are used an additional loss of twenty-five to forty per cent. in light is the result.

On the other hand, lava-tip burners, with large openings, either batwing or fish-tail form, gave an illuminating power of seven to fifteen per cent. greater than the power obtained with the standard (Sugg Letheby), and nearly equaled the light furnished by the improved London Argands. Flat-flame burners of this description are in every respect suitable and economical for all purposes of general illumination.

The great improvement in the construction of Argand burners is well proven by the results of tests with Sugg's London Argands and the Silber burners, they yielding twenty per cent. more light than the present standard, and for reading, drawing, or writing, in fact for any purpose where a soft and steady light is needed, similar to that obtained with Moderator oil-lamp, these burners will be found most excellent, and all that could be desired.

INSPECTION OF METERS.

One thousand three hundred and nine meters were inspected and proved by this office during the fiscal year ending June 30, 1880, for the Washington and Georgetown Gas-Light Companies and for consumers of gas. Of this number 36 registered fast against the consumer; average error, 5.41 per cent. Eighty-nine registered slow against the companies; average error, 9.87 per cent. One thousand one hundred and sixty-seven registered within the limits required by law, namely, 2 per cent. either way, and were sealed and returned to the companies for service; 17 did not register the gas flowing through them.

One hundred and eighty-three of the above-mentioned meters were tested on complaint, as follows: Fifty-four were complained of by consumers of gas—23 registered fast, average error 4.59 per cent.; 5 registered slow, average error 5.74 per cent., and 26 registered within the limits allowed by law. One hundred and twenty-nine were complained of by the gas companies—6 registered fast, average error 7.10 per cent.; 77 registered slow, average error 16.77 per cent.; 29 registered within the limits allowed, and 17 did not register. This is caused by the diaphragms or partitions, which are made of leather, having perforations in them, which allows gas to flow through the meters without working the gearing which is connected with the index; consequently no registration takes place.

A large proportion of the gas meters now in use in this District are very accurate measurers, and the good results of inspection are demonstrated daily, as the average error of meters that have been once inspected and proved, and complained of again either by the companies or consumers, supposing them to be wrong, proves on reinspection to be much less than those meters which have never been inspected and proved by this office previously to being placed in service.

As there are meters still in use in this District that have not been inspected, proved, and sealed, and as probably not more than one in three are correct, I would respectfully recommend that the law be modified so as to require the Washington and Georgetown Gas-Light Companies to replace meters of this description within a specified time by meters that have been inspected, proved, and sealed.

I would further recommend that the law be modified so as to require, when for any purpose whatever the heads of meters that have been inspected, proved, and sealed are removed by the gas companies, meters

of this description should be classed as repaired meters, and brought to this office for reinspection before again being placed in service.

The seal of the inspector is the evidence that the meter has been properly tested and proven, as required by law. To admit the right of the companies to remove the head of a sealed meter and rectify whatever is wrong and return meter to service without reinspection and sealing would be to render the law practically inoperative.

S. CALVERT FORD,
Inspector of Gas and Meters.

A.—Report of the illuminating power and purity of the gas supplied by the Washington Gas-Light Company from June 30, 1879, to June 30, 1880.

Months of the year.	Number of observations.*	Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.			Number of occasions that sulphuretted hydrogen was present during the year.
		Mean.	Highest.	Lowest.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	
July.....	24	16.62	18.38	12.39	1.96	2.44	1.25	8.20	10.41	6.57	4
August.....	27	17.21	19.46	16.23	1.73	2.09	1.03	11.38	15.16	8.49	
September.....	26	16.55	17.78	15.01	1.05	1.63	.51	10	19.72	8.22	
October.....	26	16.48	17.82	15.30	1.88	4.98	.44	15.99	26.03	7.39	
November.....	23	16.31	17.05	15.76	.46	.85	.20	12.02	15.89	4.65	8
December.....	25	16.32	16.81	15.59	.64	1.70	.27	13.49	15.34	12.05	25
January.....	26	17.11	18.40	15.97	.70	2.55	.24	15.49	21.09	10.68	26
February.....	24	17.59	19.00	16.32	.92	1.44	.42	11.55	13.63	10.13	24
March.....	25	17.27	18.54	16.03	1.24	2	.64	10	13.70	7.39	13
April.....	27	16.70	17.52	16.00	1.67	2.83	.42	7.89	10.96	5.82	(1)
May.....	25	17.32	18.69	16.46	2.81	5.01	1.78	6.63	9.59	4.52	5
June.....	26	17.11	18.53	16.33	2.14	4.50	1.02	6.59	9.59	4.11	26
Sum total for the year.....	304	202.59			17.20			129.23			154

† No record.

AVERAGE FOR THE YEAR.

Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.			Sulphuretted hydrogen.
Mean of 304 observations.*	Highest.	Lowest.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	Number of times present during the month.
16.88	19.46	12.39	1.43	5.01	.20	10.76	26.03	4.11	154
	Aug. 8	July 16		May 10	Nov. 21		Oct. 8	June 2	

* Each observation consists of twenty readings on the Bunsen photometer, at intervals of one minute.

REMARKS.—On 17 occasions the illuminating power of the gas was less than 16 candles. On 6 occasions sulphur was in excess of the quantity allowed. With the exception of these violations, the quality and purity of the gas, supplied by the Washington Gas-Light Company during the year, has been in accordance with the requirements of the act of Congress regulating gas-works, approved June 23, 1874.

S. CALVERT FORD,
United States Inspector of Gas and Meters for the District of Columbia.

B.—Report of the illuminating power and purity of the gas supplied by the Georgetown Gas-Light Company from June 30, 1879, to June 30, 1880.

Months of the year.	Number of observations.	Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.			Number of occasions that sulphuretted hydrogen was present during the year.
		Mean.	Highest.	Lowest.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	
July	25	16.78	18.48	15.58	7.65	12.85	1.70	8.20	10	1.37	1
August	26	16.81	18.20	15.06	5.37	8.02	3.16	8.42	10.54	7.26	
September	26	16.87	18.54	15.12	2.27	3.29	1.32	10.44	12.05	8.76	
October	26	16.83	18.04	15.27	1.10	1.42	.73	10.81	12.27	7.61	
November	23	16.40	18.10	15.36	1.62	5.27	.59	10.99	13.58	9.17	
December	26	16.97	18.62	13.89	.62	.88	.51	12.65	17.67	10	
January	25	16.94	19.29	15.81	.54	.62	.45	14.06	16.85	11.23	3
February	23	16.77	18.02	14.69	.58	.98	.34	13.16	17.19	10	2
March	25	17.51	18.92	16.53	.51	.68	.37	9.89	11.64	8.42	
April	27	16.07	18.54	14.56	.53	1.05	.27	9	10	7.60	1
May	25	16.77	17.81	15.50	1.05	1.61	.68	9.74	13.70	7.26	1
June	26	16.47	17.80	15.52	1.79	2.04	1.51	12	14.65	7.94	2
Sum total for the year	303	202.09			23.63			129.36			10

AVERAGE FOR THE YEAR.

Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.			Sulphuretted by hydrogen.
Mean of 303 observations.*	Highest.	Lowest.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	Mean number of grains.	Highest number of grains.	Lowest number of grains.	
16.84	19.29	13.69	1.96	12.85	.27	10.78	17.67	1.37	10
	Jan. 7	Dec. 24		July 16	Apr. 6		Dec. 22	July 7	

* Each observation consists of twenty readings on the Bunsen photometer, at intervals of one minute.

REMARKS.—On 25 occasions the illuminating power of the gas was less than 16 candles. On 29 occasions ammonia was in excess of the quantity allowed. With the exception of these violations, the quality and purity of the gas supplied by the Georgetown Gas-Light Company during the year has been in accordance with the requirements of the law of Congress regulating gas-works, approved June 23, 1874.

S. CALVERT FORD,
United States Inspector of Gas and Meters for the District of Columbia.

C.—*Report of meters inspected and proved for the Washington Gas-Light Company and for consumers of gas in Washington from June 30, 1879, to June 30, 1880.*

Months of the year.	Whole number of meters tested.	New meters for company.	Number fast.	Per cent. fast.	Number slow.	Per cent. slow.	Number correct.	Repaired meters for company.	Number fast.	Per cent. fast.	Number slow.	Per cent. slow.
July.....	81							72			1	2.66
August.....	98							27				
September.....	98							21			1	4.88
October.....	225	121	3	2.83			118	21				
November.....	88	52	1	2.83			31	45				
December.....	147	93					88	54			1	3.23
January.....	125	81			1	4.83	80	33				
February.....	49	6					6	27				
March.....	145	45					45	28			1	6.67
April.....	91							81	1	4.66		4.88
May.....	70	1					1	52			1	3.50
June.....	66							53				
Total.....	1,217	379	4	*3.68	1	*4.33	374	717	1	*4.66	6	*4.12

Months of the year.	Number correct.	Consumers' meters on complaint of consumers.	Number fast.	Per cent. fast.	Number correct.	Consumers' meters on complaint of company.	Number fast.	Per cent. fast.	Number slow.	Per cent. slow.	Number correct.	Consumers' meters on complaint of company that did not register.
July.....	71					9			9	24.09		
August.....	27					9	1	12.33	3	15.12		
September.....	91	3			3	2			2	10.88		
October.....	90	4	1	7.33	3	7			7	14.99		2
November.....	46	1			1	3			3	29.61		1
December.....	83	3	1	7.25	2	11			9	17.99	2	6
January.....	83	2	2	5.08		5			3	18.55	2	4
February.....	27	7	4	4.91	3	8			5	21.92	3	1
March.....	92	2	2	4.20		7			7	12.63		1
April.....	79	5	3	3.83	2	3	1	5.66	2	4.75		2
May.....	53	5	1	3.83	4	5			5	16.20		
June.....	63					3			3	8.49		
Total.....	710	32	14	*5.15	18	72	2	*3.99	63	16.26	7	17

* Average.

REMARKS.—During the fiscal year ending June 30, 1880, this office inspected and proved for the Washington Gas-Light Company and for consumers of gas in Washington 1,217 meters. Of this number 21 registered fast, average error 5.47 per cent.; 70 registered slow, average error 3.23 per cent.; 1,109 registered within the limits allowed by law, namely, 3 per cent. either way; and 17 did not register the gas flowing through them.

S. CALVERT FORD,

United States Inspector of Gas and Meters for the District of Columbia.

D.—Report of meters inspected and proved for the Georgetown Gas-Light Company and for consumers of gas in Georgetown from June 30, 1879, to June 30, 1880.

Months of the year.	Whole number of meters tested.	Repaired meters for company.	Number fast.	Per cent. fast.	Number correct.	Consumers' meters on complaint of consumers.	Number fast.	Per cent. fast.
July.....	27	24	.....	.....	24	2	1	2.56
August.....	3	.....	.....	.....	.....	.....	.....	.....
September.....	23	.....	.....	.....	.....	1	.....	.....
October.....	10	1	.....	.....	1	.....	.....	.....
November.....	4	.....	.....	.....	.....	2	.....	2.57
December.....	4	.....	.....	.....	.....	1	.....	2.75
January.....	12	5	2	6.88	8	4	.....	4.13
February.....	8	.....	.....	.....	.....	.....	.....	.....
March.....	5	.....	.....	.....	.....	3	1	7
April.....	1	.....	.....	.....	.....	1	.....	.....
May.....	1	.....	.....	.....	.....	1	.....	.....
June.....	1	.....	.....	.....	.....	.....	.....	.....
Total.....	92	30	2	*6.88	28	22	9	4.04

Months of the year.	Number slow.	Per cent. slow.	Number correct.	Consumers' meters on complaint of company.	Number fast.	Per cent. fast.	Number slow.	Per cent. slow.	Number correct.
July.....	.....	.....	1	1	.....	.....	1	12.65	1
August.....	.....	.....	1	2	.....	.....	8	14	12
September.....	.....	.....	1	23	2	4.35	4	4.47	4
October.....	.....	.....	.....	9	1	4.16	1	32	1
November.....	.....	.....	2	2	.....	.....	.....	.....	1
December.....	1	4.38	1	1	.....	.....	.....	.....	1
January.....	1	8.66	2	1	.....	.....	.....	.....	1
February.....	.....	.....	2	1	.....	.....	.....	.....	1
March.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
April.....	2	7.66	.....	2	1	7.16	.....	.....	1
May.....	1	7.33	1	.....	.....	.....	.....	.....	.....
June.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	5	*5.74	8	40	4	*5.21	14	*17.28	23

* Average.

REMARKS.—During the fiscal year ending June 30, 1880, this office inspected and proved for the Georgetown Gas-Light Company and for consumers of gas in Georgetown 92 meters. Of this number 15 registered fast, average error 6.88 per cent.; 19 registered slow, average error 11.51 per cent.; and 58 registered within the limits allowed by law, namely, 3 per cent. either way.

S. CALVERT FORD,
United States Inspector of Gas and Meters for the District of Columbia.

E.—*Report showing the pressure of the gas supplied by the Washington Gas Light Company, as registered in this office, from July 1, 1879, to June 30, 1880.*

Month.	Mean pressure expressed in inches.	Maximum pres- sure expressed in inches.	Minimum pres- sure expressed in inches.
July .....	.887	3.650	.625
August .....	.872	2.775	.525
September .....	.855	1.200	.400
October .....	.904	1.175	.550
November .....	.961	1.250	.425
December .....	.963	1.250	.725
January .....	.964	1.250	.800
February .....	.912	1.250	.800
March .....	.990	1.275	.580
April	1.011	1.550	.700
May	1.194	1.625	.750
June	1.119	1.550	.800
Total	11.573	.....	.....

Average: Mean pressure, .964 inches; maximum pressure, 3.650 inches; minimum pressure, .425 inches.

REMARKS.—The pressure on the main at this point is two-tenths of an inch less than recorded above.

R. CALVERT FORD,

United States Inspector of Gas and Meters for the District of Columbia.

F.—*Statement of receipts and expenditures during the fiscal year ending June 30, 1880.*

Cash balance on hand July 1, 1879	\$1,057 07
Cash received in fees and from other sources from July 1, 1879, to June 30, 1880	716 36
	1,773 43
Amount expended for maintaining and keeping in good order and repair the laboratory and apparatus from July 1, 1879, to June 30, 1880	1,141 59
Cash balance on hand July 1, 1880	631 84

REPORT

OF THE

ARCHITECT OF THE UNITED STATES CAPITOL.

ARCHITECT'S OFFICE, UNITED STATES CAPITOL,
Washington, D. C., October 1, 1880.

SIR : As relates to the public works in charge of the Architect of the Capitol, I have the honor to submit the following report, showing the progress made since the date of the last annual report from this office, together with a statement of the expenditures for the same, made during the fiscal year ending June 30, 1880.

CAPITOL.

The improvements to the Hall of Representatives, which were ordered by the commission, of which the Hon. Abraham Hewitt is chairman, have been completed. These consist mainly in connecting the rooms at the south of the Hall with the lobby, by which a large retiring room for members was made; constructing air-duct and shaft, opening some distance from the building on the west front, so as to prevent the introduction of air into the Hall charged with coal-gas from chimneys, and other impurities from the building, as has been the case formerly; and by greatly increasing the openings in the floor of the Hall, for the admission of fresh air.

These changes have added largely to the comfort of the occupants of the Hall, and have afforded an ample supply of pure air for respiration. Fireplaces have also been placed in the Hall. These changes and improvements seem to have given general satisfaction. The whole of the interior of the center building has been painted, and much done to the Dome. The rooms vacated by the Court of Claims have been renovated, repaired and painted, and are now used by committees of both houses. Many committee-rooms and corridors have likewise been painted.

The heating apparatus of the Senate has been put in order, and in some cases new radiators supplied; the openings in the floor of the Senate Chamber are being enlarged for the better supply of air, and many iron panels taken from the ceiling of the Chamber, which are to be supplied with lights of ground glass.

Four small sky-lights have been placed on the north side of the roof, by which the light in the Senate Chamber will be improved and equalized.

But little progress has been made on the frescoes of the belt in the Dome, owing to the illness and death of the late Constantino Brumidi.

Philipo Costagini, an artist of acknowledged merit, educated in the same school as the former artist, is now engaged on these frescoes, and shows by his work that he is a master in the art.

Tin cases for the iron shelving of the file-room of the House of Representatives have been provided.

I recommend that similar shelving and cases be furnished for the Senate files—the present being of wood, and liable to destruction by fire.

Congress, at the last session, passed an act appropriating seven thousand dollars for a passenger elevator for the south wing of the Capitol, to be located by the Speaker and the Architect of the Capitol, with a proviso, that “the location of such elevator shall not in any wise interfere with the use or occupation of, or communication between, any of the offices or committee-rooms of the House, nor with lighting or ventilation thereof, or of any corridor.”

These conditions, the Speaker and the Architect consider, amount to a prohibition, as it is not possible to place an elevator in the building that will not in “any wise” interfere with the light and ventilation.

In consequence, nothing has yet been done in the way of putting in the proposed elevator.

It is hoped that Congress will at its next session so change the law as to remove the restriction referred to, that the money provided for this purpose may yet be available during the present fiscal year for the purpose named in the law. That an elevator is not only desirable but necessary, is obvious.

Mr. I. H. Rogers, electrician of the House of Representatives, reports that the electrical department in his charge is in good order, and that by changes which have been made in the dynamo-electrical machines, the gas, when turned on, can now be ignited much more rapidly than heretofore.

By this device, from five to nine squares can be lighted at a time, instead of one square, as hitherto.

Since the purchase of the dynamo-electrical machines the batteries have been dispensed with entirely, saving the government from \$1,000 to \$1,200 per annum, and at the same time have enabled us to experiment extensively with the different systems of electric lights.

These experiments were referred to in the bill which appropriated the money for the machines, and pursuant thereto, he has so far developed this light as to render it more steady than heretofore, and well adapted to lighting large areas, but he cannot recommend it for the legislative halls, on account of the flickering which still remains, but earnestly recommends it for the Capitol grounds and surrounding parks.

There were received at this office the following sums: from R. C. Hewitt, \$321 for old bricks from out-building at the Public Printing Office; from the New Jersey Iron and Steel Works, \$13.50 for hauling iron beams; and from various persons, \$97 for old doors, sash, and windows from the buildings torn down at Pennsylvania avenue and First street; amounting to \$431.50, which sum has been transmitted to the disbursing officer to be covered into the Treasury.

I again call attention to the necessity of making some provision for rendering the old Hall of Representatives and the rooms adjoining less liable to loss by fire.

CAPITOL GROUNDS.

The progress made in the improvement of these grounds will be seen by the following report of Mr. F. H. Cobb, engineer:

“I have the honor to report that progress toward the completion of the Capitol Grounds has been constant, but, owing to the limited appropriation, not so much has been done as in some former years.

“The improvements have always contemplated the erection of the grand stairways on the west front as part of the original design adopted

by Congress, and all work has been done with reference to the removal of the two earthen terraces and the substitution of marble.

"For this reason no change has been made next the west front of the building further than to outline the lower platform connecting it with the walks leading from Pennsylvania and Maryland avenues. The approach from Pennsylvania avenue is complete, with the exception of the steps and part of the coping, both of which are now being put in place.

"Bronze standards for lamps are to be erected along this walk, furnished with electric light, but, as no method has proved entirely successful, the matter has been deferred until a more satisfactory result can be obtained.

"The piers at the entrances and salient points of the circles along West First street have been surmounted by elaborate bronze lanterns, lighted with gas. Single bronze standards have also been placed at the principal entrances on the north and south sides, and similar ones will be put at the remaining entrances during the present year.

"The stone boundary-walls in progress at the date of the last report have been finished, and the grounds are now inclosed with the exception of a part on the south and east sides.

"These are under contract and will be completed before next spring. Granite piers on the south side, at the carriage entrance from West First street, are also to be erected.

"In all, 2,017 square yards of artificial stone pavement have been laid since the report for last year; 630 yards of this was mosaic work on Pennsylvania and Maryland avenue walks. A few defects have appeared, but they are repaired by the contractor as soon as possible. In general, this pavement fully justifies the high reputation that it has borne in the past, and constant travel for five years over a portion of it has failed to appreciably damage it.

"The asphalt pavements laid during the year 1877 are to be delivered up during the present summer by the contractors.

"The terms of their agreement required them to turn their work over to the government in perfect condition, at the expiration of three years, when their retained percentage would become due. Considerable repairing will be necessary for that situated immediately upon the east front of the building, and also that laid on the northeast and southeast corners. The remainder, laid on East Capitol street and the entrance from Pennsylvania avenue south is in good condition.

"The narrow strip of concrete on North B street, between North Capitol street and Delaware avenue, has been replaced with granite blocks similar to those on the remainder of this street.

"This was a much-needed improvement.

"As far as possible, the improvements have been distributed equally on the north and south sides.

"The air-shaft described in the last report has been completed. It has ample capacity for the needs of the House, and presents an ornamental appearance on the west grounds.

"The structure is substantially built of rock-faced blue gneiss and dressed granite, rising to a height of 20 feet above the surface. The whole is to be surmounted by an ornamental lattice roof. The duct leading to the fans is a half circle of brick, 10 feet in diameter, resting on stone abutments, with concrete floor.

"The location is so arranged as to present as little resistance as possible to the passage of air, and seems to perfectly answer the purpose of its construction.

"There has been much complaint from the want of a resting place for

those who walk from the bottom of the hill to the building. To meet this want a structure is now being erected, designed to combine both drinking fountain and a secluded and cool retreat, while sufficiently public to prevent its being used for improper purposes."

Mr. Olmsted says :

The use of ordinary park-seats, either movable or fixed, will be better avoided in these grounds, for reasons of taste and propriety, as well as the disorder and misuses to which they would lead.

If it should be attempted to do without any resting place, however, the inconvenience that would result would probably lead to the adoption of some unsuitable expedients. Hence it has been thought better to introduce special arrangements, designed with all practicable precautions against abuse.

The summer-house in question will provide for persons passing through the north-west grounds a cool and shady place in which a few minutes rest can be taken without interruption to the walks or breaking the leading lines of view.

It is intended to provide a drinking-fountain, about which a number of persons may stand without obstructing the walks ; and, lastly, incidentally to the above purposes, to secure conditions favorable to certain types of beauty in vegetation. When overgrown with ivy it will be indistinguishable in any general view across the grounds, being merged into the adjoining verdure.

On the up-hill side a deep alcove of rock-work is provided, looked into from the house through an oval stone frame. Through this alcove a rivulet is carried (being the waste water from the old drinking-fountain at the west entrance of the Capitol). The rock-work is mainly covered with the more delicate ivies.

The roof is made of roughened tile, and will be mantled with ivy both within and without.

It will take about three years for the plants to grow to a point where the esthetic motives of the design will begin to be realized.

To prevent any misuse, the doorways are provided with iron gates, which will be closed at night.

The policing of the grounds has prevented depredations in a large degree, and preserved good order ; the members of the force should, however, be made special police of the Metropolitan department.

EXTENSION TO GOVERNMENT PRINTING-OFFICE BUILDING.

The extension of this building, provided for by the act approved March 3, 1879, has been completed.

Notwithstanding this large addition to the building the old portion is in some parts very much crowded and overloaded.

COURT-HOUSE.

The damage occasioned by the recent fire at the building has been repaired.

The defective gutters of the eastern wing have been taken out and new ones put in.

The entire roof has been repaired and painted, and all of the chimney tops which were much cracked and rapidly going to pieces have been rebuilt, newly capped, and painted.

The court rooms have been painted and otherwise improved.

The narrow escape which the upper and inflammable portion of the building made at the late fire adds force to my former recommendation of providing a more secure place for the land records of the District of Columbia.

Statement showing amounts expended from June 30, 1879 to June 30, 1880, as follows :

CAPITOL EXTENSION.

For amount of pay-rolls of mechanics, labor, &c	\$27, 153 36
For amount paid for painting material	2, 015 19
For amount of salary of Architect	4, 500 00
For amount paid for plumbing and steam-fitting material	3, 631 81
For amount paid for hardware and iron	1, 486 22
For amount paid for salary of disbursing agent	1, 000 00
For amount paid for lumber	1, 451 01
For amount paid for material for covering fly-doors, &c	233 08
For amount paid for marble and granite	276 38
For amount paid for freight	298 68
For amount paid for winding clocks, &c., center building	100 00
For amount paid for cement, lime, bricks, &c	405 60
For amount paid for brushes, soap, sponge, &c., and for cleaning floors ..	381 35
For amount paid for stationery	129 82
For amount paid for forage	172 48
For amount paid for rent of carpenters' and smiths' shops	120 00
For amount paid for labor not on pay rolls, paid by voucher	845 78
For amount paid for miscellaneous items	102 95
For amount paid for fresco painting	2, 428 80
For amount paid for nickel plating	162 50
For amount paid for one cellar hoist	240 00
For amount paid for material for backs of gallery seats	301 04
For amount paid for machinists' work and material	1, 053 62
For amount paid for perforated seats for galleries	454 71
For amount paid for fuel for shops	107 60
For amount paid for grates	205 64
For amount paid for brass castings	737 38

50, 000 00

Amount appropriated March 3, 1879 50, 000 00

VENTILATING HALL OF THE HOUSE OF REPRESENTATIVES.

For amount of pay-rolls, clerks, mechanics, and labor	10, 670 68
For amount paid for hardware	594 88
For amount paid for granite and stone work	1, 824 32
For amount paid for clerk	546 66
For amount paid for iron castings	725 66
For amount paid for mantles and grates	1, 124 00
For amount paid for sheet-iron air-ducts	847 00
For amount paid for lumber	619 33
For amount paid for seats	624 67
For amount paid for tile	623 37
For amount paid for hygrometers	23 75
For amount paid for hard-wood doors	240 00
For amount paid for perforating seats	299 19
For amount paid for lime, brick, cement, sand, &c	938 00
For amount paid for brass work	4, 612 48
For amount paid for plumbing material	327 78
For amount paid for transportation	71 78
For amount paid for labor not on rolls, paid by voucher	438 12
For amount paid for constructing air-duct	3, 783 18
For amount paid for fresco painting	997 60
For amount paid for stationery	31 55
For amount paid for nickel plating	36 00

30, 000 00

Amount appropriated March 3, 1879 30, 000 00

HEATING APPARATUS UNITED STATES SENATE.

For amount paid for iron castings	\$781 09
For amount paid for repairs to machinery	1, 051 44
For amount paid for steam and water pipe fittings	339 88

For amount paid for wrought-iron steam coils	\$900 00
For amount paid for steam traps	134 00
For amount paid for laboring work	81 25
For amount paid for grate bars	227 48
For amount paid for steam-pump	250 00
For amount paid for hardware	88 12
For amount paid for belting	146 74
	<hr/>
	4,000 00
	<hr/>
Amount appropriated March 3, 1879.....	4,000 00

LIGHTING UNITED STATES CAPITOL AND GROUNDS.

For amount of pay-rolls, superintendent of meters, and lamp-lighters.....	\$2,714 75
For amount paid for gas consumed.....	21,604 82
For amount paid for regulators	764 04
For amount paid for gas-burners, chandeliers, and globes	550 09
For amount paid for wire, zinc, and chemicals for electric battery	1,178 20
For amount paid for lamp-posts and lanterns	560 07
For amount paid for dynamo-electric machines	2,400 00
For amount paid for reflectors	200 00
For amount paid for repairs to meters.....	544 04
For amount to be returned to the Treasury.....	1,883 99
	<hr/>
	32,400 00
	<hr/>
Amount appropriated March 3, 1879.....	32,400 00

CAPITOL GROUNDS.

For amount paid for advertising proposals	\$17 37
For amount paid for air-shaft.....	683 52
For amount paid for bluestone steps Pennsylvania avenue walk	1,578 93
For amount paid for coping wall North B street	2,147 47
For amount paid for coping wall South B street	524 98
For amount paid for coping wall New Jersey avenue.....	1,593 66
For amount paid for coping wall Maryland avenue	557 91
For amount paid for coping wall Pennsylvania avenue.....	587 85
For amount paid for coping-wall foundations.....	296 74
For amount paid for bronze lanterns	5,496 96
For amount paid for Cook's pavement, artificial stone	3,027 06
For amount paid for Cook's pavement, mosaic	2,219 85
For amount paid for Schillinger's pavement	572 12
For amount paid for asphalt pavement.....	302 63
For amount paid for flag footwalk	51 21
For amount paid for brick footwalk, Maryland avenue.....	313 81
For amount paid for iron tree-boxes and guards	175 50
For amount paid for iron railing	834 48
For amount paid for summer-house material	2,098 32
For amount paid for brick	250 00
For amount paid for cement	512 70
For amount paid for stone.....	30 00
For amount paid for lumber	223 53
For amount paid for sand	53 60
For amount paid for freight and hauling	409 92
For amount paid for drainage.....	525 61
For amount paid for gas and water service	152 53
For amount paid for hardware and tools	261 45
For amount paid for lawn seats, Pennsylvania avenue	300 00
For amount paid for soil	465 00
For amount paid for sodding and seed	48 10
For amount paid for shrubbery	992 78
For amount paid for manure and other fertilizers.....	612 17
For amount paid for rent of carpenter's shop	120 00
For amount paid for rent and expenses of office and yard	303 31
For amount paid for services of men, paid by voucher.....	390 10
For amount paid for services of men, paid by pay-roll	23,204 84
For amount paid for services of F. L. Olmsted	2,000 00

For amount paid for services of Thomas Wisedell	\$620 60
For amount paid for services of O. C. Bullard	231 50
For amount paid for expenses of F. L. Olmsted	164 70
For amount paid for miscellaneous bills	62 25
	<hr/>
	60,000 00
	<hr/>
Amount appropriated March 3, 1879	60,000 00

EXTENSION TO GOVERNMENT PRINTING OFFICE BUILDING.

For amount of pay-rolls	\$7,806 63
For amount paid for tin work	1,286 92
For amount paid for lime, sand, and cement	505 60
For amount paid for iron beams, rafters, and castings	3,697 31
For amount paid for lumber	2,980 57
For amount paid for bricks and bricklaying	4,983 05
For amount paid for cut stone and window-sills	337 77
For amount paid for hardware	716 82
For amount paid for labor not on pay-rolls, paid by vouchers	791 63
For amount paid for concrete paving	227 49
For amount paid for plumbing, gas, and steam-fitting	2,972 75
For amount paid for paint and painting	842 17
For amount paid for iron roofing	689 24
For amount paid for plastering	430 56
For amount paid for reflectors for gas-lights	716 00
For amount paid for rent of workshops	55 00
Amount expended prior to July 1, 1879	14,244 57
Amount to be returned to the Treasury	516 19
	<hr/>
	43,800 00
	<hr/>
Amount appropriated March 3, 1879	43,800 00

Very respectfully submitted.

EDWARD CLARK,
Architect United States Capitol.

Hon. O. SCHURZ,
Secretary of the Interior.

REPORT
ON THE
RECONSTRUCTION OF THE PATENT OFFICE BUILDING.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
Washington, D. C., October 22, 1880.

SIR: I have the honor to transmit herewith the report of Adolf Cluss, engineer and architect, in relation to the operations pertaining to the reconstruction of the Patent Office during the year ending October 1, 1880, for your information.

Very respectfully, your obedient servant,

E. M. MARBLE,
Chairman Board of Supervision.

Hon. A. BELL,
Acting Secretary of the Interior.

OFFICE OF ENGINEER AND ARCHITECT,
RECONSTRUCTION OF PATENT OFFICE BUILDING,
Washington, D. C., October 4, 1880.

SIR: As requested by you, I herewith transmit a report of the operations pertaining to the reconstruction of the Patent Office Building, and have the honor to be,

Very respectfully, yours,

ADOLF CLUSS.

Hon. E. M. MARBLE,
Chairman Board of Supervision.

OFFICE OF ENGINEER AND ARCHITECT,
RECONSTRUCTION OF PATENT OFFICE BUILDING,
Washington, D. C., October 1, 1880.

SIR: I have the honor to submit a report of operations pertaining to the reconstruction of the United States Patent Office Building from November 16, 1879, the date of my former report, to this date, with a recapitulation of the cost of the whole work which is now drawing to a close. The north wing is in readiness to receive the fire-proof model cases, for which appropriation was made last summer, but the west wing wants some finishing work.

In order to show the progress of the work during the period embraced in this report, the operations are below classed under a few general heads:

IRON-WORK.

The completion of the frame of the roofs, preparatory to the laying of the concrete arch blocks, was delayed late into the month of December by the difficulty of receiving comparatively few miscellaneous beams and bars from the rolling-mills. In all details under the immediate control of the contractors, the Phoenix Iron Company, of Trenton, N. J., commendable diligence was used. The window frames, casings, and architraves, the casings of the numerous circular light-wells, stairs, gallery floors, balconies, pilasters, and columns were all in place, so that the plastering could be commenced in March, with the opening of the season. The setting of the railings, most of which are circular work, could not be proceeded with before the slate floors of the galleries were laid. This caused a break in the work, and has kept the iron-workers busy in the building up to date.

In view of a rising market, all possible dispatch was used from the outset to bring the bulk of the iron-work under contract. This has been achieved at favorable rates. Minor details, such as walks and railings around the outer and inner skylights, iron frames and sash between both skylights, iron ceilings over the north portico and western staircase, were attended to in the progress of the work and bought at market rates.

CUT STONE AND BRICK-WORK.

Only after the removal of the temporary roofs it was possible to have the cracked, broken, and in part calcined marble and granite jambs, lintels, and sills of the windows on fronts and yard repaired. This was promptly and economically done by substituting piece-work for days' work with the stonecutters.

The bricklayers have completed the cutting down of the inner faces of the walls, straight and plumb; they have built the pediments between the brick piers across the center naves which subdivide the continuous inner skylight into compartments. They have filled in and properly secured all exposed flanges or faces of iron beams or bars with fire-proof material in plastic state. The interstices between the wrought-iron columns supporting the galleries, and their cast-iron shells, have also been fire-proofed in similar manner. The whole areas of the roofs have been concreted upon the upper faces of the fire-proof roofing blocks with a thick surface coat of Portland cement, which by itself forms a water-tight roof, but is again protected by a copper roof. To do this work full justice, in the winter season, has been an expensive and most troublesome task. The bricklayers' and stone-cutters' work has been done by mechanics working directly for the government, under superintendence.

HOLLOW FIRE-PROOF BLOCKS.

These blocks were used for the roofs in the shape of heavy arches, and for ceilings underneath the gallery floors in part in the shape of lighter arches and in part in the shape of bridge-tiles. Much difficulty was experienced in obtaining seasonably proper material under the contract entered into for this work, and considerable delay was incurred by the unavoidable rejection of improper material, but finally all difficulties were overcome.

COPPER ROOFING.

The roofs and gutters were all laid by days' work, with tinned copper, rivetted longitudinally and transversely, laid and securely fastened down

in such dimensions and by such methods as have proved during the past hot summer to make ample provisions for expansion and contraction. When these roofs were laid the temperature of the atmosphere was mostly near freezing point.

GLASS AND GLAZING.

The outer skylights have all been glazed with one-half inch thick, rough, hammered glass, laid on tarred rope and made tight with elastic cement; the inner skylights with one-quarter inch thick ribbed glass; the sash and frames between the two skylights with best double thick cylinder glass, and the windows on the main floor with polished plate glass.

The outer skylight is glazed with over 500 sheets of glass of 2 by 10 feet in size, and has been laid with all the precautions which the ample experience of the United States Treasury Department has matured. But to get such extensive areas perfectly tight takes continued vigilance, intelligent attention, and patience. No unusual defects have occurred; still some attention is yet necessary.

The glass was all bought under contract and laid or set by days' work.

WOOD-WORK.

This branch is confined in this whole reconstruction to eighty-five mahogany sash of the windows on main floor, and to a few hand-rails of same material.

IRON FURRING AND LATHING.

Wherever it was feasible all furrings of whatever kind were avoided. Iron furring and lathing was only used for casing the girders which span the openings between the brick piers transversely across and to both sides of the center nave. It was done by contract.

PLASTERING.

The plastering was commenced with a strong force in the middle of March and completed by the 1st of July. All the plain work was done by the day; the ceilings were done with lime mortar and a sand finish preparatory to receiving frescoing. The side walls and piers were all plastered solidly with Keene's coarse cement, and prepared to receive oil color. This has proved excellent work, equal in hardness and finish to marble, but superior to marble in fire-proof qualities. The cornice-work was done by select mechanics, under strict supervision, and paid for as piece-work.

ORNAMENTAL (KEENE'S) CEMENT WORK.

The pilaster architecture, starting on the floor line of the first gallery to both sides of the center nave, consists of work done with Keene's superfine cement. The material for the shafts is mixed with the ingredients necessary to produce the style of Sienna marble, and has received a high polish; the capitals and superincumbent ornamentation are also done in same material, but finished flat. The nature of this work is such that it has been found most judicious to have a number of skilled mechanics associate themselves for the purpose, working in concert by the piece. By starting this work early in December last, it was got ready and put up at once, whenever the progress of the co-operating branches permitted it.

MARBLE TILING.

The center naves and passages connecting with staircase and adjoining wings are laid with marble tiling upon a bed of Portland cement. It consists of panels of octagonal white marble tile from the quarries of Brandon, Vt., with dots of black marble. These panels are bordered by friezes, consisting of red, variegated Champlain and of grey marble. This tiling was laid under a contract entered into, after due advertisement, with Messrs. Gannon & Flannery, of Washington; the tiling is all laid and being cleaned off at this date. The government has furnished the material, cement and sand, for laying the tile.

KEENE'S CEMENT FLOORS.

The space of the main floor underneath the galleries, which will be occupied by the model cases, is floored with Keene's coarse cement laid upon a base of Portland cement. It was laid by superior mechanics, working at piece-work, the government furnishing all the material.

SLATE FLOORS OF GALLERIES.

These floors cover an area exceeding an acre. The contract for material and work with the North Peach Bottom Slate Company, of Philadelphia, entered into on September 13, 1879, required the completion of the work in December, 1879. The contractors do not appear to have fully appreciated the difficulties of quarrying slabs of such large sizes as are required for our work, or otherwise singular ill-luck must have struck the leading slate quarries of Pennsylvania, which constitute the only available source of supply for this material, since, notwithstanding my persistent efforts, this work has been dragging along up to date when the last finishing touches are put on it.

DRAINAGE AND WATER SUPPLY.

Near the northeast and southeast ends of the west wing sewer connections and water supply were brought up so that at either place a part of a model case may be cut off and converted into a lavatory and water-closet.

In both wings 2-inch water pipe, with hose-cocks on main floor and both galleries, have been brought up on the yard walls from the basement floor. To make these conveniences and precautionary measures available, a sufficient water supply for the District must of course be calculated upon.

PLAIN AND ORNAMENTAL PAINTING.

This work was commenced with a limited force working by the day, while the plastering was in progress, since Keene's cement work when painted requires one coat of priming within 24 hours after it has been laid on. Instead of the usual white lead, silicate white paint has been used throughout for the body of the paint. Without causing extra expense, its superiority has been conclusively established as a lasting and thorough preservative of iron and wood.

The plain and the ornamental painting has been carried on simultaneously; the north wing is substantially finished, but the completion of the work in the west wing will have to be delayed on account of the exhaustion of funds.

MISCELLANEOUS.

Wherever it could be done to advantage, the skilled and unskilled labor required in the several branches was directly employed for the government under competent and careful foremen. Owing to the nature

of the work and the circumstances under which it was done, the amount expended for miscellaneous labor, such as hoisting of material, removal of rubbish, scaffolding, regulating floors, &c., was of necessity heavy, but on the other hand no accidents whatever of any account have occurred to men or materials.

CONTRACTS.

The contracts entered into and accepted proposals since the date of my last report are as follows:

Date of contract.	Description of work.	Name of contractor.	Rates.	Amounts, specific or estimated.
Apr. 21, 1880	Marble tiling	Gannon & Flannery..		\$4,354 08
Nov. 3, 1879	Concrete manilla	A. D. Gordon, Philadelphia.	1½ cents per square yard.	651 50
Mar. 10, 1880	Plaster of Paris	J. G. & J. M. Waters..	\$1.25 per barrel	644 50
Mar. 3, 1880	Lime for plastering	W. H. Godey	85 cents per barrel	543 15
	Cattle hair	do	22 cents per pound	81 48
Feb. 15, 1880	Keene's coarse cement..	Howard Fleming, New York.	\$5.75 per barrel	3,009 56
Do	Keene's superfine cement.	do	\$9.50 per barrel	1,584 00
Do	White silicate paint	do	10 cents per pound	843 22
Dec. 31, 1879	Iron furring and lathing of cornices.	Dwight & Hoyt, Springfield.	27 cents per square foot..	2,471 74
Oct. 3, 1879	81 bay wood window-sash.	Baldwin Bros		587 25
Jan. 15, 1880	No. 1 giant sash-chain and fittings.	Smith & Egge Manufacturing Company, Bridgeport.	7½ cents per linear foot..	196 20
Feb. 1, 1880	Painters' material	G. Rynear, jr	Price list	1,687 02
June 12, 1880	Double thick cylinder glass.	Semon Bache Co., New York.		521 96
Mar. 15, 1880	¼-inch thick fluted glass put in place.	E. A. Boyd, New York.	24½ cents per square foot.	2,010 35
Mar. 10, 1880	River sand for plastering.	A. Flynn	85 cents per cubic yard..	475 15
Do	River sand for concret-ing floors.	R. M. Miller	73 cents per cubic yard..	21 90
July 15, 1880	River sand for concret-ing floors.	J. B. Lord	90 cents per cubic yard..	99 00
June 10, 1880	White sand	R. M. Miller	12 cents per bushel	55 20
Jan. 3, 1880	Coarse sand for roof concrete.	W. L. Ross	80 cents per cubic yard..	149 00
Oct. 15, 1879	Saylor's Portland cement.	Copley Cement Company, and agent.	\$2.90 per barrel of 400 pounds.	2,053 20

FINANCIAL STATEMENT.

The lowest estimate before Congress for the completion of the work of reconstruction was \$250,000.

The appropriation made by Congress under date of March 3, 1879, including *corrected* balance available under appropriation made June 20, 1878, foots up to \$244,920.43.

The endeavor to bring the total cost of the work down to the available amount was frustrated by the difficulties of obtaining material and work under contract at the stipulated times, which cause reacted most unfavorably on the cost of the work done by the day during last winter and spring and on contingent expenses. The return of prosperity to the business interests of the country, which increased materially the cost of various building materials, worked in the same direction.

The available appropriation has been spent as follows:

For erection of elevator and preparing for work	\$557 06
Repairing and dismantling temporary roofs and repairs to adjoining roofs	1,666 43
Hoisting material, removing rubbish, scaffoldings, and miscellaneous labor	7,760 20
Brick-work and preparing main floor for concrete	16,766 70
Granite and marble cutting	4,303 23
For iron-work of roof and galleries	50,889 62

For miscellaneous iron-work, derrick-work, iron ceilings, roofs of porticos, and staircase, walks and railings around skylights, sash and frames between skylights, iron doors to roof, scuttle, ladder, &c.....	\$18,067 67
For iron-work of interior finish.....	30,069 84
For hardware and labor on sliding doors.....	391 40
For iron ridge ventilator and casings of inner skylight.....	2,041 27
For fire-proof concrete blocks of roof and galleries.....	11,143 43
For concreting of roofs.....	3,059 20
For copper roofing.....	18,429 87
For drainage, gas, and water supply.....	1,217 10
For iron furring and lathing of girders.....	2,471 74
For plastering.....	14,723 01
For ornamental (Keene's) cement work.....	7,482 31
For glass and glazing of and between skylights.....	6,668 98
For window-sash, glass, glazing and hanging.....	2,877 82
For plain and ornamental painting.....	5,438 41
For marble tiles of main floor.....	4,966 48
For Keene's cement floors.....	3,428 36
For slate floors of galleries.....	14,508 80
For contingent services in office and on building.....	12,835 43
For traveling expenses, freights, printing, advertising, and stationery.....	1,841 02
For temporary office, tools, and furniture.....	1,275 03
Total.....	244,920 48

In order to enable the work to be finished up as thoroughly as it has been begun and prosecuted up to date, the following items ought to be provided for at as early a day as possible:

For overhauling and putting in best condition the skylights glazed during last winter.....	\$400
For furnishing and putting on hardware to the windows.....	200
For bay wood hand-rails, mostly circular, of gallery and railings.....	800
For plain and ornamental painting and marbleizing the west wing.....	1,250
For iron sills to form tight joints on top of slate slabs of both galleries, all around center naves, and miscellaneous finishing.....	2,290
For one additional coat of paint for roofs.....	300
For India-rubber plates on steps of 16 stories of gallery and stairs.....	500
For covering the leaky floors of the northern porticos (on level of main story) with asphalt.....	175
	5,915

It is respectfully suggested that the importance of making immediate provision for the above items be brought to the attention of Congress, so that the building can be turned over to the Interior Department in complete order.

It would be a neglect if attention would not be called again to the strange condition of the ceiling and roofs of the south wing of the Patent Office. The stately main portico is a mere tinder-box overhead. The wooden frame of the main roof, though saved from destruction by the fury of the fire through the exertions of the firemen, is charred to a considerable extent, and a spark may set it on fire. The leaky covering of the roof is in large sections temporarily patched up with tin. This is certainly a case which demands prompt attention. The risk is too disproportionate to the value and importance of the building with its valuable records.

I have the honor to be, very respectfully, your most obedient,
ADOLF CLUSS,
Engineer and Architect.

Hon. E. M. MARBLE,
Chairman Board of Supervision, Washington, D. C.

REPORT

OF THE

BOARD OF VISITORS OF THE GOVERNMENT HOSPITAL FOR THE INSANE.

NON-RESIDENT OFFICERS OF THE HOSPITAL.

VISITORS.

JOSEPH K. BARNES, M. D., U. S. A., <i>President of the Board.</i>	CHARLES WORTHINGTON, Esq. Mrs. A. M. GANGEWER. " AMELIA J. ROWLAND. ADM. JOHN J. ALMY, U. S. N. REV. JOHN LANAHAN, D. D.
JOSEPH TONER, M. D. JAMES C. WELLING, LL. D. WILLIAM GRIER, M. D., U. S. N.	

EXECUTIVE COMMITTEE OF THE BOARD.

Messrs. BARNES, TONER, AND GRIER.

CHAPLAINS.

Rev. JOHN CHESTER, D. D. " A. FLORIDUS STEELE. " J. G. BUTLER, D. D.	Rev. J. W. PARKER, D. D. " S. F. RYAN. " JOHN LANAHAN, D. D.
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RESIDENT OFFICERS OF THE HOSPITAL.

W. W. GODDING, M. D., *Superintendent and ex-officio Secretary of the Board of Visitors.*
A. H. WITMER, M. D., *First Assistant Physician.*
MAURICE J. STACK, M. D., *Second Assistant Physician.*
GEORGE W. FOOTER, M. D., *Third Assistant Physician.*
SAMUEL B. LYON, M. D., *Chief Clerk and Visiting Physician to the Relief.*

REPORT OF THE BOARD OF VISITORS.

GOVERNMENT HOSPITAL FOR THE INSANE,
Near Washington, D. C., October 1, 1880.

SIR: In behalf of the Board of Visitors, we respectfully submit for your consideration the twenty-fifth annual report.

The following tables present a synopsis of the operations of the hospital, with the changes, for the year ending June 30, 1880.

Summary.

	Males.	Females.	Total.
Remaining June 30, 1879.....	617	202	819
Admitted during the year ending June 30, 1880.....	181	44	225
Whole number under treatment.....	798	246	1,044
Recovered.....	38	14	52
Improved.....	23	10	33
Unimproved.....		3	3
Died.....	46	13	59
Total discharged and died.....	107	40	147
Remaining June 30, 1880.....	691	206	897

Admissions and Discharges.

	Males.		Females.		Totals.
REMAINING JUNE 30, 1879.					
Army { White	405	413	4	4	417
..... { Colored ..	8		0		
Navy { White	40	40		198	40
..... { Colored ..	0				
Civil life { White	124	164	145	202	362
..... { Colored ..	40		53		
ADMITTED DURING THE YEAR 1879-'80.					
Army { White	108	112		44	112
..... { Colored ..	4				
Navy { White	12	13		44	13
..... { Colored ..	1				
Civil life { White	42	56	35	44	100
..... { Colored ..	14		9		
			181		225

Admission and discharges—Continued.

		Males.		Females.		Totals.
UNDER TREATMENT DURING THE YEAR.						
Army	{ White	513	525	4	4	529
	{ Colored ..	12		0		
Navy	{ White	52	53			53
	{ Colored ..	1				
Civil life	{ White	166	220	180	242	462
	{ Colored ..	54		62		
			798		246	1044
DISCHARGED DURING THE YEAR—Recovered.						
Army	{ White	16	17	1	1	18
	{ Colored ..	1		0		
Navy	{ White	4	4			4
	{ Colored ..	0				
Civil life	{ White	13	17	13	13	30
	{ Colored ..	4		0		
			38		14	52
DISCHARGED DURING THE YEAR—Improved.						
Army	{ White	14	14			14
	{ Colored ..	0				
Navy	{ White	1	1			1
	{ Colored ..	0				
Civil life	{ White	8	8	9	10	18
	{ Colored ..	0		1		
			23		10	33
DISCHARGED DURING THE YEAR—Unimproved.						
Army	{ White					
	{ Colored ..					
Navy	{ White					
	{ Colored ..					
Civil life	{ White			3	3	3
	{ Colored ..			0		
DECEASED DURING THE YEAR.						
Army	{ White	30	30			30
	{ Colored ..	0				
Navy	{ White	5	5			5
	{ Colored ..	0				
Civil life	{ White	6	11	9	13	24
	{ Colored ..	5		4		
			46		13	

Admissions and discharges—Continued.

		Males.		Females.		Totals.
REMAINING JUNE 30, 1880.						
Army	{ White	453	464	3	3	467
	{ Colored ..	11		0		
Navy	{ White	42	43		203	43
	{ Colored ..	1				
Civil life	{ White	139	184	146	206	387
	{ Colored ..	45		57		
			691			897

NOTE.—There were four less persons than cases under treatment in the course of the year, by reason of four readmissions.

Physical condition of those who died.

Exhaustion of chronic mania	1	Cardiac disease	3
Exhaustion of acute mania	1	Typho malarial fever	2
Paresis	7	Asphyxia (suicide)	1
Pneumonitis	2	Bronchitis	1
Phthisis pulmonalis	7	Arachnitis	1
Epilepsy	3	Paralysis	1
Apoplexy	7	Peritonitis	1
Chronic diarrhoea	4	Scrofulosis	1
Inanition	6	Tuberculosis	1
Organic disease of brain	7		
Gangrene of the lungs	1	Total	59
Purulent infiltration of lung	1		

Duration of the mental disease of those who died.

Less than three months	2	Six years	4
Three to six months	5	Ten years	8
One year	9	Twelve years	3
Two years	11	Eighteen years	1
Three years	8	Twenty-seven years	1
Four years	3		
Five years	4	Total	59

Duration of disease on admission.

		Males.		Females.		Totals.
LESS THAN SIX MONTHS.						
Army	{ White	24	24			24
	{ Colored ..	0				
Navy	{ White	8	8			8
	{ Colored ..	0				
Civil life	{ White	22	27	21	27	54
	{ Colored ..	5		6		
			59		27	86

Duration of disease on admission—Continued.

		Males.		Females.		Totals.	
LESS THAN ONE YEAR.							
Army	{ White	15	17				17
	{ Colored ..	2					
Navy	{ White	5	5				5
	{ Colored ..	0					
Civil life	{ White	4	5	4			9
	{ Colored ..	1		0	4		
ONE TO TWO YEARS.							
Army	{ White	52	54	27		4	31
	{ Colored ..	2					
Navy	{ White		12				15
	{ Colored ..						
Civil life	{ White	10	12	3			66
	{ Colored ..	2			3		
OVER TWO YEARS.							
Army	{ White	4	3				4
	{ Colored ..						
Navy	{ White		3				7
	{ Colored ..						
Civil life	{ White	3	3	1			4
	{ Colored ..				1		
OVER THREE YEARS.							
Army	{ White		1				3
	{ Colored ..						
Navy	{ White		1				3
	{ Colored ..						
Civil life	{ White	1	1	1			2
	{ Colored ..				1		
OVER FOUR YEARS.							
Army	{ White	5	5	1			5
	{ Colored ..						
Navy	{ White		1				7
	{ Colored ..						
Civil life	{ White	1	1	1			6
	{ Colored ..				1		
FIVE TO TEN YEARS.							
Army	{ White	2	2				2
	{ Colored ..						
Navy	{ White		1				3
	{ Colored ..						
Civil life	{ White	1	1	3			4
	{ Colored ..				3		
				3		3	6

Duration of disease on admission—Continued.

		Males.		Females.		Totals.	
TEN TO TWENTY YEARS.							
Army	{ White.....	4					
	{ Colored ..		4				4
Navy	{ White.....						
	{ Colored ..						
Civil life	{ White.....	2					
	{ Colored ..	1	3				3
			7				7
OVER TWENTY YEARS.							
Army.....	{ White.....	2					
	{ Colored ..		2				2
Navy	{ White.....						
	{ Colored ..						
Civil life	{ White.....	2		1			
	{ Colored ..		2		1		3
			4			1	5
Army	{ White.....						
	{ Colored ..						
NOT INSANE.							
Civil life	{ White.....	1					
	{ Colored ..		1				1
			1				
UNKNOWN.							
Civil life	{ White.....			1			
	{ Colored ..			1	2		2
						2	
Total :.....							225

Table showing the nativity, as far as could be ascertained, of the 4,940 cases treated.

NATIVE BORN.		FOREIGN BORN.	
District of Columbia	523	Ireland	1,035
New York	370	Germany	693
Maryland	345	England	118
Virginia	332	France	50
Pennsylvania	263	Canada	43
Ohio	133	Scotland	37
Massachusetts	119	Switzerland	15
Maine	54	Italy	21
Illinois	47	Denmark	13
Connecticut	42	Norway	10
New Hampshire	45	Sweden	11
Indiana	40	Poland	11
Kentucky	34	Russia	6
Michigan	30	Austria	5
New Jersey	35	Nova Scotia	8
Tennessee	24	Spain	4

Table showing nativity, &c.—Continued.

NATIVE BORN.		FOREIGN BORN.	
Wisconsin	20	Holland	6
Vermont	23	Wales	4
Missouri	18	Portugal	3
Rhode Island	15	Hungary	4
Delaware	13	Mexico	3
North Carolina	18	Saxony	4
Alabama	7	Malta	3
South Carolina	8	Cyprus	1
Iowa	4	Belgium	3
Georgia	9	Buenos Ayres	1
Mississippi	9	Costa Rica	1
Louisiana	4	Bavaria	2
West Virginia	6	Sicily	1
Kansas	2	British Columbia	1
Florida	2	British Possessions	1
Texas	4	East Indies (British)	1
California	2	West Indies (British)	4
Choctaw Nation	2	West Indies, Hayti	1
Colorado	1	New Brunswick	1
Arkansas	1	Cuba	2
		Sandwich Islands	1
		China	1
		Coast of Africa	2
Total	2,604	Total	2,131
Native born			2,604
Foreign born			2,131
Unknown			205
Total			4,940

Form of disease in cases admitted.

	Total. last year.	Admitted during year.	Total.
Mania, acute	1,767	61	1,828
Mania, chronic	721	38	759
Melancholia	531	47	578
Dementia	1,215	48	1,263
Dementia, senile	50	4	54
Paranoia	43	12	55
Dipsomania	336	5	341
Typhomania (Bell's disease)	2		2
Kleptomania	3		3
Nymphomania	3		3
Imbecility	31	8	39
Opium eaters	10	1	11
Not insane	3	1	4
Total	4,715	225	4,940

Complications of those admitted.

	Total last year.	Admitted during year.	Total.
Epilepsy	254	14	268
Apoplexy		2	2
Paralysis	107	1	108
Suicidal disposition	123	3	126
Homicidal disposition	45		45
Periodicity	184	2	186
Puerperal state	37	2	39
Catalepsy	7		7
Nostalgia	29	2	31
Post febrile condition	41		41

As far as could be ascertained, the volunteers of the Army and Navy under treatment during the year ending June 30, 1880, entered the service from the following States:

	Army.	Navy.	Total.
New York	50		50
Ohio	29		29
Pennsylvania	22		22
Indiana	24		24
Michigan	11		11
Illinois	17		17
Wisconsin	13		13
Missouri	4		4
Connecticut	8		8
New Hampshire	5		5
Vermont	1		1
Maryland	7		7
Massachusetts	21		21
New Jersey	6		6
Maine	7		7
Nebraska	2		2
Delaware	1		1
Minnesota	1		1
Iowa	2		2
North Carolina	1		1
California	1		1
New Mexico	1		1
Kentucky	1		1
West Virginia	2		2
Unknown	7	1	8
Total	244	1	245



Tabular statement of the time of life at which the 4,940 cases treated since the opening of the institution became insane.

Under 10 years.....	82
Between 10 and 15 years.....	53
15 and 20 years.....	309
20 and 25 years.....	926
25 and 30 years.....	1,011
30 and 35 years.....	871
35 and 40 years.....	553
40 and 45 years.....	372
45 and 50 years.....	255
50 and 60 years.....	242
60 and 70 years.....	129
70 and 80 years.....	45
80 and 90 years.....	5
Unknown.....	84
Not insane.....	4
Total.....	4,940

Private patients.

					Total
There were at the beginning of the year..	6	males,	9	females	15
Received during the year.....	2	do.	5	do.	7
Whole number under treatment.....	8	do.	14	do.	22
Discharged during the year.....	2	do.	5	do.	7
Remaining at the end of the year	6	do.	9	do.	15

Table showing the history of the annual admissions since the opening of the hospital, with the discharges and deaths, and the number of each year remaining June 30, 1880.

Years.	Admitted.				Of each year's discharged and died in 1880.				Total discharged and died of each year's admissions.				Remaining of each year's admissions, June 30, 1880.	
	New cases.				Recovered.				Improved.				Unimproved.	
	Male.	Female.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
1855.....	28	37	.....	.....	65	.....	.....	.....	.....	.....	.....	.....	.....	.....
1856.....	36	11	.....	.....	47	.....	.....	.....	.....	.....	.....	.....	.....	.....
1857.....	24	25	1	2	52	.....	.....	.....	.....	.....	.....	.....	.....	.....
1858.....	27	11	2	3	43	.....	.....	.....	.....	.....	.....	.....	.....	.....
1859.....	41	15	2	3	65	.....	.....	.....	.....	.....	.....	.....	.....	.....
1860.....	67	19	1	5	92	.....	.....	.....	.....	.....	.....	.....	.....	.....
1861.....	60	30	4	1	95	.....	.....	.....	.....	.....	.....	.....	.....	.....
1862.....	172	11	2	1	186	.....	.....	.....	.....	.....	.....	.....	.....	.....
1863.....	323	18	7	7	355	.....	.....	.....	.....	.....	.....	.....	.....	.....
1864.....	402	23	22	2	509	.....	.....	.....	.....	.....	.....	.....	.....	.....
1865.....	492	34	26	2	514	.....	.....	.....	.....	.....	.....	.....	.....	.....
1866.....	162	24	12	4	222	.....	.....	.....	.....	.....	.....	.....	.....	.....
1867.....	111	18	17	3	109	.....	.....	.....	.....	.....	.....	.....	.....	.....
1868.....	103	28	15	5	153	.....	.....	.....	.....	.....	.....	.....	.....	.....
1869.....	111	32	19	3	168	.....	.....	.....	.....	.....	.....	.....	.....	.....
1870.....	100	26	16	10	182	.....	.....	.....	.....	.....	.....	.....	.....	.....
1871.....	131	28	14	6	195	.....	.....	.....	.....	.....	.....	.....	.....	.....
1872.....	100	38	23	6	166	.....	.....	.....	.....	.....	.....	.....	.....	.....
1873.....	100	37	23	14	204	.....	.....	.....	.....	.....	.....	.....	.....	.....
1874.....	100	28	27	10	230	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875.....	100	37	24	10	230	.....	.....	.....	.....	.....	.....	.....	.....	.....
1876.....	100	87	30	14	218	.....	.....	.....	.....	.....	.....	.....	.....	.....
1877.....	100	87	28	10	198	.....	.....	.....	.....	.....	.....	.....	.....	.....
1878.....	100	81	29	13	182	.....	.....	.....	.....	.....	.....	.....	.....	.....
1879.....	100	42	31	11	222	.....	.....	.....	.....	.....	.....	.....	.....	.....
1880.....	100	33	22	11	225	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals..	710	396	160	4,940	38	14	52	23	10	38	.....	3	.....	3
						46	13	59	1,844	251	2,095	534	156	690
						121	43	164	880	214	1,094	691	206	897

Table showing admissions, discharges, and deaths, with the mean annual mortality and proportion of recoveries; per cent. of the discharges, including deaths, for each year since the opening of the hospital.

Years.	Admitted.				Recovered.				Discharged.				Died.		Remaining June 30 in each year.				Average numbers resident.				Percentage of recoveries on discharges.				Percentage of deaths on average numbers.				Percentage of deaths on total numbers under treatment.					
	Total.		Improved.		Unimproved.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.		Total.					
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.				
1855-56	26	37	63	3	3	3	5	8	16	59	109	54	37	98	79	18	37	50	35	33	33	35	71	12	13	10	08	06	06	66	07	48				
1856-57	36	11	47	3	4	3	1	10	8	16	59	109	54	37	98	79	18	37	50	35	33	33	35	71	12	13	10	08	06	06	66	07	48			
1857-58	25	27	52	4	6	3	1	4	7	3	10	59	109	54	37	98	79	18	37	50	35	33	33	35	71	12	13	10	08	06	06	66	07	48		
1858-59	29	14	43	13	5	18	1	2	2	4	7	3	10	59	109	54	37	98	79	18	37	50	35	33	33	35	71	12	13	10	08	06	06	66	07	48
1859-60	47	18	65	16	5	21	1	4	2	6	3	8	6	54	138	72	83	56	24	129	17	57	42	73	08	22	07	11	07	74	35	03	71	05	49	
1860-61	68	24	92	26	7	33	4	3	2	5	13	5	18	106	61	167	100	68	59	00	159	68	58	52	41	31	25	08	11	07	74	35	03	71	05	49
1861-62	64	31	95	42	11	53	5	2	12	7	19	109	72	181	109	76	64	81	174	57	08	55	43	10	40	10	40	10	40	10	40	10	40	10	40	
1862-63	174	12	186	06	8	104	14	15	3	3	36	147	65	212	123	75	65	74	189	47	70	59	42	83	05	53	15	19	09	09	11	11	90	04	10	
1863-64	330	25	355	107	6	203	17	18	5	6	203	76	279	168	41	72	31	240	72	71	59	42	83	05	53	15	19	09	09	11	11	90	04	10		
1864-65	484	25	509	282	6	288	69	1	70	5	167	93	260	277	42	83	81	381	23	54	70	40	60	65	73	56	10	08	34	05	53	15	19	09		
1865-66	478	36	514	315	9	323	110	2	11	11	139	86	280	189	66	80	46	278	12	52	29	40	60	65	73	56	10	08	34	05	53	15	19	09		
1866-67	194	28	222	104	5	109	20	7	27	10	11	11	11	11	11	90	70	281	62	58	42	83	05	53	15	19	09	09	11	11	90	04	10			
1867-68	88	21	109	45	7	52	11	3	14	11	12	19	14	12	19	96	44	317	61	59	40	60	65	73	56	10	08	34	05	53	15	19	09			
1868-69	120	33	153	49	15	64	6	2	5	8	22	25	102	328	221	17	96	44	317	61	59	40	60	65	73	56	10	08	34	05	53	15	19			
1869-70	133	35	168	59	11	70	9	2	10	24	9	33	259	129	368	244	55	108	63	58	50	39	54	69	81	08	33	08	30	70	14	05	06			
1870-71	116	36	152	32	8	40	16	8	24	11	15	31	123	454	294	69	108	06	476	00	36	37	34	67	05	01	08	33	08	30	70	14	05			
1871-72	161	34	195	50	12	62	21	3	28	4	3	33	123	454	294	69	108	06	476	00	36	37	34	67	05	01	08	33	08	30	70	14	05			
1872-73	142	44	186	43	8	51	16	3	29	8	37	44	422	139	561	407	21	131	57	538	78	41	34	37	39	44	13	07	02	05	03	27				
1873-74	133	51	204	49	15	64	23	5	28	6	32	45	468	152	620	431	63	144	11	575	14	45	70	39	47	02	07	76	05	01	08	33	08			
1874-75	192	38	230	67	12	79	22	8	30	6	39	51	526	166	692	492	44	151	36	643	80	50	35	29	47	02	07	76	05	01	08	33	08			
1875-76	179	51	230	68	9	75	24	5	30	6	39	51	526	166	692	492	44	151	36	643	80	50	35	29	47	02	07	76	05	01	08	33	08			
1876-77	166	47	213	67	17	83	26	10	36	1	48	58	576	168	744	564	78	165	50	730	67	47	80	37	48	02	07	76	05	01	08	33	08			
1877-78	147	51	198	66	11	80	32	9	37	2	52	63	583	182	765	587	41	176	30	783	71	49	45	44	68	02	07	76	05	01	08	33	08			
1878-79	169	53	222	68	24	92	30	7	41	3	57	12	600	193	793	586	82	184	37	781	19	40	33	38	96	03	08	04	06	22	03	98	04			
1879-80	181	44	225	38	14	52	23	3	46	13	59	601	206	897	655	84	196	63	851	97	35	51	35	54	46	93	06	10	07	72	06	03	98			
Total, 26 yrs.	4,070	870	4,940	1,844	251	2,095	534	156	690	121	43	164	880	214	1,094	880	214	1,094	880	214	1,094	880	214	1,094	880	214	1,094	880	214	1,094	880	214	1,094	880	214	

The number of admissions during the year, 225, is above the usual rate, and the number remaining under treatment at the close of the year, 897, is considerably in excess of that at the close of any previous year. Congress at the last session limited the admission of the late soldiers and sailors to those classes which are named in the Revised Statutes of the United States as entitled to the benefit of the hospital. It is too soon to decide how much relief we shall experience from the change; but, judging from the results of the first three months since the law went into operation, the best that can be hoped is that henceforth the number of inmates will not greatly increase. Since the 1st of July, 1880, 51 patients have been admitted; 63 were received in the corresponding three months of the last year, and 62 in the three months of the year previous. This would indicate a falling off in the number of admissions for the present year of nearly fifty, as compared with the last two years, but during these years the number of persons remaining under treatment has risen from 793 on the 30th of June, 1878, to 897 on the 30th of June, 1880, which is a gain of 104 in two years; so that unless the number of discharges can be considerably increased, which, in view of the chronic character of so large a majority of the cases, can hardly be hoped for, our number, which is certainly enough, will remain about as at present.

The mortality for the year was 59, it being nearly seven per cent. of the average number under treatment, or five and six-tenths per cent. of the whole number treated. This is considerably below the usual average, and the more satisfactory that it shows our household has not suffered seriously in health from the overcrowding of the wards. The attempt to relieve the hospital by discharging to the care of friends such as, although not fully restored, were able to live at home with safety, has somewhat reduced the percentage of recoveries, it being a little more than thirty-five per cent. of the number of discharges, and only about five per cent. of the whole number under treatment.

The hospital is for the care of all cases as well as for the cure of the insane; what institutions of this class are doing in both of these directions is a matter of public interest. The act of Congress establishing a United States hospital for the "most humane care and enlightened curative treatment of the insane of the Army and Navy of the United States and of the District of Columbia," was approved March 3, 1855, and it seems proper that space should be taken in this the twenty-fifth annual report of the Board of Visitors to state briefly what has thus far been accomplished for the cure and what care is being rendered to these unfortunate wards of the nation.

The statistics of the hospital show that 4,940 or a little less than five thousand cases have been under treatment since the buildings were first opened for patients in January, 1855. Of these 1,094 have died and 2,095 recovered. The result approximately is that of every five persons admitted one will die, two recover, and two remain to be supported and cared for by the government. These figures are probably a little too favorable a showing; hospital statistics are at best only approximations to the truth, and subject to considerable correction for the elimination of cases that, apparently well here and discharged as such, needed only the removal of the restraints of hospital life to develop the insanity that was not cured but latent. To avoid this mistake some statisticians discard all readmissions, claiming that they could not have been recoveries in the first instance. This no doubt would be true in some but not in all cases; certainly insanity does not belong to the class of diseases that occur but once in a lifetime; exposure to the same ex-

citing causes is quite likely to bring on a fresh attack after a genuine recovery; clearly it would be absurd to claim that a man had never recovered from the ague because, residing in the same malarial district, he had the next year found it necessary to resort the second time to his quinine. Another difficulty in deciding upon the recovery in insanity is, that the normal standard of mind is one that varies with each individual, and for the expert to judge unerringly of this in all cases, it would be necessary for him to have known the person before his insanity commenced. To determine how far any mental impairment exists after the active manifestations of insanity have subsided is not an easy task; "the stream cannot rise above the fountain," and a condition that would be a normal mental activity with some men would be dementia in a Webster. One person's nerves seem to be hung as it were on wires and vibrate at every touch, the next person has apparently no nervous system. "Tis a mad world, my masters," and in one way or another we are all more or less ill-balanced. No superintendent of the insane, however conscientiously he may set himself to the task of revising his statistics, can wholly avoid error, especially if, as in this hospital, the majority of cases are lost sight of as soon as discharged. But, whatever may be the possibilities of cure in individual cases, or whatever the statistics may seem to show, those most conversant with the disease, in this country and in Europe, will probably agree in the conclusion that at the present time not more than one in three of those who become insane recover. While experience shows that if taken in time some forms of insanity are eminently curable, there are others that are hopeless from the start, a brain disease that to some extent seems an outgrowth of modern civilization and is certainly on the increase. Is there, then, any the less need for treatment because we know that two-thirds will not recover? None the less for treatment and the more for care; indeed, since the care of the insane in hospitals has undoubtedly increased the average length of life in the cases that do not recover, this class has so multiplied that today one of the most urgent questions in social economy and public charity is, what shall we do with our chronic insane?

The policy of this hospital has from the first been at once economic and liberal; to omit nothing deemed essential to the proper care and nothing that might aid in the cure of the insane, but to avoid all expenditure not deemed strictly necessary. The entire outlay for buildings and four hundred and twenty acres of land, up to this time, omitting ordinary repairs, has not exceeded one thousand dollars per capita on the present number of patients. These buildings are all substantial brick structures, most thoroughly built, neatly but plainly furnished, and conveniently arranged for the purposes for which they were designed. A majority of the inmates being soldiers, the Army ration has been made the basis of the diet table with such additions as are rendered possible by an extensive farm devoted to dairy, vegetables, and fruit. The result is an abundant quantity of plain food, nutritious in character, with such special diet as sickness or individual conditions may require. Our patients as a rule are not of a class to have extravagant tastes or to miss luxuries.

The treatment in the Government Hospital for the Insane is not stereotyped; the immediate supervision and care of the different divisions is in the hands of competent medical men all reporting to one chief officer, and the endeavor is to treat individual cases and not insanity in the concrete. If this man needs quiet and seclusion he has it; if the other will be better for a parole, the liberty is given; such an one is dangerous to himself or others, and is subjected to restraint; opium is

not interdicted when it is no longer fashionable, nor does the latest hypnotic find favor because it will not do to be behind the times; in the interests of the insane we undertake to be old fashioned or any fashioned if "by any means we may save some." This or that course is not resorted to because it is the English method, or consonant with the American idea, but simply because it meets the individual case; we are not wedded to any system, nor do we claim to have any new light; are not specially gifted, only thankful for common sense; it is a practical working hospital, not an ideal one.

The site of this hospital was admirably chosen. Standing upon a broad plateau on a commanding height some two miles due south of the capital, it overlooks both the city of Washington and the Potomac River. While a hospital for the insane should be built apart from the town, that ought not to be hidden from view; there is less of the feeling of isolation when one looks upon the moving panorama of the boats upon the river, and there is society in the evening lights of the city beyond; it is the calm presence of the world outside without its distracting roar. The two hundred acres within the inclosing wall, which is their home, will in time become one of the most beautiful spots in the neighborhood of Washington. Nature has bountifully endowed it with variety of scenery in grove and ravine, hill-slope and river-side, while careful cultivation is every year adding something to its charms. No insane person is injured by natural beauty; greensward irritates no nerves however sensitive; those who pass by the flowers to-day may turn to them with delight to-morrow; so, it is well to widen our green lawns and brighten the walks with roses. In the line of the esthetic treatment of the insane, we hang the halls with pictures, send out flowers to the tables and rooms, bring in music and singing birds, and nine out of ten care for none of these things; what is it to them that the sunshine is in the sky, so it shines not in their lives! Ah! but it is the individual case, the tenth one that we are content to benefit with all this; the nine suffer no harm from pleasant surroundings; surely we do not err in making their home more homelike.

So with labor as a part of the treatment of the insane; it is not a remedy of universal application; indeed, some may be injured by it, though, except in the acute forms of the disease, we think such cases are rare. As a rule, work when it is cheerfully engaged in, benefits the insane, partly as a diversion and partly as an outlet, as it were, to the mental excitement. If this hospital could be said to maintain any dogma in regard to the treatment of the insane, which, however, we deny, it would be that work and a certain decree of freedom are essential to the contented residence if not to the cure of the insane in hospitals. That the above will hold true in a majority of cases our experience convinces us, but to apply it to all would be absurd; some patients cannot be trusted with any liberty, elopement seems to be a manifestation of their disease, and their constant study is how to get away. Others seem to have no volition left, and the mind cannot be brought up to the level of an intelligent action; but the hoe and the pickaxe appeal to a class of minds low down in the scale of intellectual effort, and painstaking effort will accomplish much in the way of automatic labor. It will often be found, too, when our veteran eloper is set to work and his mind diverted with his occupation that he has ceased to run away; we prize what is hard to obtain, but when it is freely offered we question its value, and the insane man who can walk away any day is apt to wait till to-morrow. Very insane men do work with us, and are the better for the labor.

In their relation to the two-fold question of labor and limited freedom

our detached buildings become prominent. The original plan of this hospital involved detached buildings for certain classes. This was at first only made available as a separate provision for the colored insane, but as the numbers increased and it became necessary to make further accommodations, a distinct hospital building and inclosed grounds for the female patients was happily decided upon. Unfortunately the considerable outlay necessary for suitable buildings for a proper provision for the women has delayed their erection up to the present time. The matter will be brought before Congress at its next session and it is thought that there can be no reason for further delay; certainly nothing is more essential to the continued progress of the hospital in "the most enlightened curative treatment of the insane." Largely extended liberty could be given to both sexes, and facilities for classification would be doubled at once; it would change the character of the whole institution. Pending the erection of the hospital for the women it became necessary that immediate steps should be taken for the relief of our crowded wards, and detached buildings for distinct classes of the male patients were provided for by Congress and constructed of brick at a very moderate cost, not exceeding two hundred and fifty dollars per patient. These are plain, but thoroughly built houses, and as detached buildings for the classes for whom they are designed are very creditable. We shall be pleased to have them examined by those who are interested in such matters, and would recommend to Boards of State Charities and those having the control of our State hospitals for the insane to consider whether some such detached buildings for special classes, erected at a moderate cost within the grounds of their present hospitals and under their supervision and control, would not be a better provision for the surplus insane that now crowd their wards than to turn them over to the town and county almshouses.

The Atkins Hall provides on the barrack plan for 65 laborers, has a liberal diet adapted to their requirements, and is as open and free as any private house; the building is light, cheerful, and homelike, and the inmates as they smoke their pipes under the trees after the work of the day is over count themselves the aristocrats of the establishment; so labor has its rewards.

The Relief Building provides for about 200 patients—three distinct classes, arranged by floors, each admitting of two subdivisions and combining the barrack system with single rooms. These buildings are very cheerful and airy and are tastefully finished in Georgia pine. The first floor requires no guards in the windows; on the upper floors a light wire lattice is used as a protection against accident rather than with any design to confine the inmates. The third floor is set apart for those pursuing indoor occupations, their work-room being in the upper story, together with an amusement hall for their exclusive use in the hours of recreation. Here patients who for one reason or another are not suited for or disposed to out-door labor may find employment at broom-making, mat-braiding, and other occupations; a glass-cutter stands at his wheel, an artist works with his pencil, the idea being that all of these men shall have something to do, whether profitable or otherwise, the industry of the insane not being subject to the ordinary laws of trade. The lower floor of the building is occupied by a class who from one or other infirmity are not capable of labor but can be trusted to a certain extent and may be able to render some service about the grounds, of which it is proposed to inclose several acres, immediately surrounding their buildings and to give them full liberty there. Not to go farther into detail from what has been merely outlined, it will be seen how easy it is to extend this plan of detached buildings to the decided advantage of cer-

tain classes of the insane. While the main building will remain the hospital proper, and by the removal of the female patients to their own hospital ample accommodations will be afforded for the different grades of acute cases and for the feeble and infirm who require more constant medical supervision and care, the detached buildings can be better adapted in their architectural arrangements to the wants of special classes than the uniform wards of a hospital can be; as, for example, a detached building for our future erection will be a small structure built like a private house with nothing of the air or furnishings of a hospital about it, where a few convalescents waiting till their health is fully established can step out of the hospital while still under its supervision.

From what has been said of the importance of labor it might perhaps be inferred that a large majority of our inmates were regularly employed; this is very far from the fact. While we believe in the importance of occupation to the insane man, and endeavor to make attractive the different industries at our command, still we cannot make labor compulsory, and the bulk of the insane are disposed to do nothing. Although the different shops and stables have afforded some opportunity for special work, till recently there has been a decided lack of opportunity for indoor occupation for the male inmates. When the work in the relief building, now just in its inception, is fully developed we shall look for a perceptible increase in the number employed. On the 30th of September, 1880, the record which is always kept here showed that 176 men and 46 women were at work, either indoors or out; this would be a little less than one-fourth of the whole number under treatment. It ought to be said that the day was chosen at random, merely as being the last day of the month, and that a number of patients, particularly women, were employed on work of their own of whom no record is made, the list being only of the regular working force of the hospital.

On the same day the record shows that 99 patients had their parole of the grounds; of course the number of female patients who can safely go unattended will be small until they are established in their own department and grounds; the probability is that then twenty-five per cent. of both sexes can with safety have the liberty that less than twelve per cent. now enjoy; at present only one of our female wards has its doors standing open by day, with the distinct and separate provision to which they are entitled there might be three. To those who will soon be well and go out from your wards it may not so much matter about the parole, only it is always a mistake to overlook the manhood in a man; but for those chronic cases that can be trusted, who will know no other home than yours, it is a cruel mistake not to take away the prison bars. It is too late in the history of the treatment of the insane to say that you have done all you can for an insane man when you have locked him up; sometimes the best curative treatment you can give him is to open his door, not indiscriminately, each individual case must be determined for itself, remembering that you alone are responsible, that you take a risk when you open the door, that you take a risk also for which you are none the less responsible when you close it on his hope.

The following is the table of farm and garden products, with their estimated value:

Apples, 137½ bushels, at 50 cents	\$68 75
Asparagus, 1,501 bunches, at 6 cents	90 06
Beans (Lima), 313½ bushels, at \$1	313 50
Beans (string), 42½ bushels, at 75 cents	31 87
Beef (fresh), 1,449 pounds, at 7½ cents	108 68
Beets, 700½ bushels, at 50 cents	350 25
Beets, 2,315 bunches, at 3 cents	69 45
Beets (greens), 18 barrels, at \$1	18 00

Blackberries, 90 quarts, at 10 cents.....	\$9 00
Cabbage, 25,270 heads, at 5½ cents.....	1, 389 85
Cabbage sprouts, 123 barrels, at \$1.....	123 00
Carrots, 955 bunches, at 3 cents.....	29 55
Carrots, 90 bushels, at 50 cents.....	45 00
Celery, 8,408 heads, at 4 cents.....	336 32
Chickens, 26½ dozen, at \$4.....	105 00
Cucumbers, 817, at 1 cent.....	8 17
Cherries, 81½ bushels, at \$3.....	243 75
Currants, 232 quarts, at 15 cents.....	34 80
Cauliflower, 400 heads, at 15 cents.....	60 00
Corn (green), 1,666½ dozen ears, at 10 cents.....	166 63
Cantaloupes, 824, at 3 cents.....	24 72
Ducks, 11½ dozen, \$5.....	57 08
Eggs, 2,532½ dozen, at 16 cents.....	405 19
Egg plants, 929, at 3 cents.....	27 87
Figs, 115 quarts, at 20 cents.....	23 00
Geese, 29, at 75 cents.....	21 75
Grapes, 15,951 pounds, at 5 cents.....	797 55
Honey, 32 pounds, 12 cents.....	3 84
Kale, 347 barrels, at \$1.....	347 00
Lettuce, 3,718, at 2 cents.....	74 36
Leeks, 3,362 bunches, at 6 cents.....	201 72
Milk, 35,556 gallons, at 30 cents.....	10, 666 80
Onions, 32 bushels, at \$1.....	32 00
Onions, 4,535 bunches, at 5 cents.....	226 75
Onions (setts), 6 bushels, at \$8.....	48 00
Oyster plants, 1,809, at 1 cent.....	18 09
Parsley, 2,962 bunches, at 3 cents.....	88 86
Parsnips, 287 bushels, at \$1.....	287 00
Peppers, 116 pecks, at 50 cents.....	58 00
Pease, 205½ bushels, at 75 cents.....	154 31
Pork, 31,916 pounds, at 6 cents.....	1, 914 96
Pigeons, 200, at 25 cents.....	50 00
Potatoes (Irish), 837½ bushels, at 75 cents.....	628 00
Potatoes (sweet), 106 bushels, at 50 cents.....	53 00
Pumpkins, 781, at 3 cents.....	23 43
Peaches, 134 bushels, at \$1.25.....	167 50
Pease, 20 bushels, at \$3.....	60 00
Quinces, 29 bushels, at \$3.....	87 00
Radishes, 1,720 bunches, at 3 cents.....	51 60
Radish (horse), 840 pounds, at 8 cents.....	67 20
Radish (greens), 3 barrels, at \$1.....	3 00
Rhubarb, 293 pounds, at 3 cents.....	8 79
Raspberries, 297 quarts, at 15 cents.....	44 55
Strawberries, 3,941 quarts, at 12½ cents.....	492 63
Spinnach, 43 barrels, at \$1.....	43 00
Squash (summer), 3,687, at 2 cents.....	73 74
Squash (turban), 1,935 pounds, at 3 cents.....	58 05
Turkeys, 20, at \$1.50.....	30 00
Turnips, 397 bushels, at 50 cents.....	198 50
Turnips (greens), 15 barrels, at \$1.....	15 00
Tomatoes, 930 bushels, at 50 cents.....	465 00
Veal, 705 pounds, at 8 cents.....	56 40
Watermelons, 1,133, at 6 cents.....	67 98

21, 824 97

The following are the products that were consumed on the farm, and consequently are not a part of the profits :

Corn (shelled), 300 bushels, at 60 cents.....	\$180 00
Corn (fodder, green), 27 acres, at \$35.....	945 00
Corn (fodder, dry), 60 tons, at \$15.....	900 00
Grass pasturage.....	1, 000 00
Grass (green), 6 acres, at \$30.....	180 00
Hay, 200 tons, at \$20.....	4, 000 00
Mangel-wurzel, 117 tons, at \$14.....	1, 638 00
Oats (green), 6 acres, at \$30.....	180 00
Ruta-baga, 47 bushels, at 45 cents.....	21 15
Straw (rye), 45 tons, at \$15.....	675 00

9,719 15

It will be observed that, notwithstanding some products are light and all prices are low, the farm is year-by year advancing in value. Our vineyard, with an annual yield of about eight tons of very excellent grapes, is a matter of pride and a pleasant feature of our farm. We hope to make our fruit orchard an equal success. The peach trees that were set three years ago are now coming into bearing, and another peach orchard of about three hundred trees has been planted this year; also between three and four hundred standard pear and apple trees have been added to the old orchard, fruit being a dessert of which our people do not easily tire. The daily supply of milk from the farm has averaged more than ninety-seven gallons, at the present writing it is one hundred and thirty gallons, and none of it is wasted; pure, fresh Alderney milk not being objectionable to any one. We still lack for barn room. The pork produced is 31,916 pounds, nearly double that of any previous year. The new piggery on the out-farm will enable us to transfer our extensive herd of swine to more commodious quarters, and at the same time rid the hospital grounds of inclosures that, from the proximity of the new buildings, have become unsightly. By the appropriation of \$15,000 by Congress at its last session for the fitting and furnishing of the relief building we have been enabled to occupy it at once, and the relief to our overcrowded wards is very manifest. As we have already spoken of this under the uses of our detached buildings, it is sufficient to say here that it is an entire success, and that we have as yet hardly begun to realize the advantage it will be to our hospital. The accommodations for help in the second story of the bakery have been completed, and are of a most satisfactory character; those in the fourth story of the main building are now in process of completion, and in addition to the greatly increased room for domestics, which is sadly needed, will give us more dormitories and a very cheerful day room for the infirmary of the male department.

As the detailed statement of receipts and expenditures made by the Superintendent for the fiscal year ending June 30, 1880, as required by the act of Congress at its last session, accompanies this report as an appendix, the usual table is omitted here.

The estimates of appropriations for the fiscal year ending June 30, 1882, are as follows:

1. For the support, clothing, and treatment in the Government Hospital for the Insane of the insane of the Army and Navy, Marine Corps, and Revenue Cutter Service, and of all persons who have become insane since their entry into the military or naval service of the United States, and who are indigent, and of the indigent insane of the District of Columbia, \$196,875.

The number of patients under treatment in the hospital on the 30th of June, 1880, was 897, and on the 31st of August it was 900. While it is to be hoped that, under the law as it now stands in relation to the admission of patients, no great increase of numbers will occur, there is no probability of any diminution, and it will not be safe to estimate for a less average than 875 of the class of indigent patients to be provided for during the fiscal year of 1881-'82. Estimating the cost per capita at \$225 per annum, which, as it includes all hospital expenditures, except those for repairs and new buildings, is certainly moderate, the amount required to be appropriated by Congress will be \$196,875.

2. For general repairs and improvements, \$10,000.

Anything like an economical administration of a hospital for the insane renders it imperative that all parts of the establishment should be kept in complete repair, and it is important that every want in this di-

rection should be met as soon as it occurs. When it is remembered that, in addition to the repairs to the building, there are roads extending over four hundred acres of land, with ornamental grounds, requiring almost constant care and expenditure for improvements, it may fairly be a question whether a distinct appropriation should not be asked for the care of gardens and lawns in addition to the above.

3. For special improvements, \$40,000.

The following special improvements are asked, viz, a supply of pure water; additional accommodations for stock, hay, and farming implements; a detached kitchen and scullery; a mortuary building; a greenhouse: in all, \$40,000.

A hospital of 900 patients, with more than 1,100 persons dependent upon it for so vital a necessity as water, ought not to have that supply so at the mercy of the elements that every storm changes it to mud. The Anacostia grows dirtier every year. The United States has munificently supplied the city of Washington with a river of pure water for its daily use, and leaves its own hospital for the insane, just beyond the Anacostia, to pump up that muddy stream and filter or settle it as best they may, when a six-inch water main from the United States Arsenal laid in the river-bed to the hospital ground, a distance of about three-fourths of a mile, mostly in shallow water, would settle the question of an abundant supply of most excellent water. The expense would probably be about \$25,000 to bring the aqueduct water to the present pumps, which are ample for all requirements. This is surer than any filtration of the present supply or any possible supply to be drawn from artesian wells to be sunk on what is at best an uncertainty. In view of the urgency of the need, it is asked that the appropriation of \$25,000 for a pure water supply be made immediately available.

Another pressing want of the hospital is additional room for the housing of stock, and storing of hay and farming implements. At present the insufficient accommodations render it necessary to stack a considerable portion of the hay crop, thereby exposing it to liability of injury from the weather. More room for stock is an imperative need. The milk product of the hospital farm has increased from 15,920 gallons in 1875 to 35,556 gallons in 1880, without any new buildings for sheltering the greatly enlarged herd, except a few sheds which afford very indifferent winter protection. It is asked that \$5,000 may be made immediately available for these very necessary farm buildings.

The kitchen, now situated in the basement of the hospital, directly under the offices, should be transferred to a detached one-story building erected for the purpose, whereby the heat and discomfort, as well as the odor of cooking, now so generously dispensed throughout the center building, would be removed and a more light and comfortable provision made for the culinary and domestic department.

The hospital is deficient in those facilities for pathological research that a suitable mortuary building would afford and which the interests of medical science demand.

As more attention is paid to the ornamentation of the grounds, looking to the out-door treatment of the inmates, the economy of a greenhouse of sufficient dimensions for the propagation of such bedding plants as are required every spring becomes apparent; something more liberal than this, that should give our inmates cut flowers for their rooms and a winter garden for their recreation, would surely not be amiss; their lot is not an enviable one, even when you have done all this.

4. For the erection of a distinct hospital building for the female insane, \$250,000; for expenditure in the fiscal year ending June 30, 1882, \$75,000.

The importance of a separate building and inclosed grounds for the female insane is nowhere more clearly shown than at the Government Hospital for the Insane. The male patients being largely in excess in point of numbers, in all matters of privilege of grounds and freedom of life, the weaker party, as usual in such cases, goes to the wall. It is simply impossible to do full justice to either sex in the matter of freedom from restraint and abundant out-door exercise so long as both are kept in the same buildings and share the same grounds. With the present hospital edifice and surrounding buildings devoted exclusively to the care of the male patients, and a new building, built on a distinct site, with all the modern improvements, for the female insane, the United States would have as complete and satisfactory provision for the care of her unfortunate insane as, speaking from the standpoint of present knowledge, could be desired. The number of females under treatment on the 30th of June, 1880, in the Government Hospital for the Insane was 206; this number will gradually increase, but it is thought that buildings designed for 250 patients will be an ample provision for the present, especially as the plan would admit of being hereafter extended to accommodate 350 without marring the architectural effect or impairing its efficiency as a hospital. While the grounds would be separated from the site of the present hospital by a dividing wall, they would be easily accessible from it for supervision, and the same laundry, bakery, water and steam supply could be made available for both departments.

It is believed that such a hospital, complete in all its appliances can be built of brick in the most substantial manner for \$250,000. As the best results in building will be attained by occupying three years in its completion, only a portion of the whole amount, \$75,000, is asked for the year 1881-'82, and that to be made immediately available.

5. A deficiency in the amount required for the support of the hospital and for repairs in the current year 1880-'81; for support \$32,000, for repairs \$5,000, making together \$37,000.

The estimated sum required and asked for the support of those patients who, in accordance with the law, are entitled to free provision in the hospital during the year ending June 30, 1881, was \$191,025, less one-half the cost of supporting the indigent insane of the District of Columbia, admitted since July 1, 1876, estimated at not far from \$16,000, which is, under the law of 1876 charged to the District, leaving \$175,000 to be appropriated by Congress. The amount appropriated was \$143,000, the difference between the appropriation and estimate being \$32,000 which is the deficiency, as above stated. The estimate for ordinary repairs and improvements was \$10,000, and the appropriation \$5,000, and the difference is \$5,000, as also stated above. These estimates were made after a careful consideration of the necessary expenditures for the proper care of an assumed number of 850 free or government patients, and a knowledge of what repairs and improvements would probably be necessary to maintain an efficient administration of the hospital in all its departments, and the estimates were designed to be as close and economical as is consistent with the welfare of the insane. The average number of indigent insane for the first month of the year has exceeded by more than twenty the number on which the estimate was based, and unless there is a very decided reduction in the number to be provided for, which we have no reason to expect, the deficiency asked will prove barely sufficient to provide all that the best care and treatment demands at our hands. The \$5,000

asked for repairs is needed to keep the government property from deterioration, and to obviate the necessity of a much larger expenditure in the future.

Just at the close of the year, Dr. Robert H. Chase, who had been connected with the medical staff of the hospital since the autumn of 1872, and had held the post of senior assistant for the last three years, resigned his place to accept the position of superintendent of the male department of the new State Hospital at Norristown, Pa. It was a deserved promotion, after nearly eight years of painstaking and devoted service, and the doctor carries with him the best wishes of the board for his success in his new field of enlarged responsibility and labor.

The vacancy in the staff of medical officers occasioned by the resignation of Dr. Chase has been recently filled, by the appointment of Dr. George W. Foster, of Bangor, Me., to the position of third assistant physician. Dr. Foster is a graduate both of the literary and medical departments of Bowdoin College; he was for a time connected with the New Hampshire Asylum for the Insane, and has given considerable attention to the study of insanity while in general practice. He appears to be well fitted for the important work which he undertakes.

The other officers of the staff have continued to render that efficient service which increased experience and their devotion to the work insure. Much of the year's success is due to their labors.

We are indebted to several Washington amateurs in music and the drama for a number of enjoyable evening entertainments, given before our household during the winter season; also to the directors of the National Fair Association for admission of our patients to their grounds, and to Colonel Casey and thoughtful lady friends who have remembered us with gifts of flowers.

It is now twenty-five years since this hospital was opened, and we hope that its work for humanity is but just begun. The nation's hospital, standing as the exponent of American civilization in the direction of the care and treatment of the insane, we again commend it to the liberal care of Congress that created it.

We are, very respectfully, your obedient servants,

JOS. K. BARNES,
President of the Board.
W. W. GODDING,
Secretary, ex-officio.

Hon. CARL SCHURZ,
Secretary of the Interior.

GOVERNMENT HOSPITAL FOR THE INSANE,
Near Washington, D. C., October 1, 1880.

SIR: In accordance with act of Congress approved June 4, 1880, requiring the Superintendent of the Government Hospital for the Insane to make a report to Congress annually of the detailed receipts and expenditures of the hospital for the preceding fiscal year, I have the honor to submit the following statement.

I am, sir, very respectfully, your obedient servant,

W. W. GODDING,
Superintendent.

Hon. CARL SCHURZ,
Secretary of the Interior, Washington, D. C.

Detailed statement of receipts and expenditures for the fiscal year ending June 30, 1880.

RECEIPTS.

Appropriation for support	\$160 000 00
Appropriation for relief building for 200 patients (\$30,000, \$9,874.99 expended prior to July, 1879)	20,125 01
Appropriation for repairs and improvements	15,000 00
Appropriation for relief building (for year ending June 30, 1881, immediately available) expended	1,414 82
Appropriation for deficiency in support	13,075 88
Receipts for board and special attendance	31,161 87
Total	240,777 58

EXPENDITURES.

Subsistence :	
Flour, meal, and crackers	\$13,353 23
Ice	946 36
Butter, cheese, and eggs	8,706 99
Fresh meats	22,532 10
Smoked and salt meats	3,294 83
Poultry and fish	3,427 92
Tea and coffee	5,096 80
Sugar and molasses	5,899 69
Other groceries	6,729 14
Fruit and vegetables	2,886 68
	\$72,873 74
House furnishing, fuel and lights, &c.	
Furniture and furnishing	4,525 25
Bedding	5,449 85
Table and towel linen	559 23
Utensils, crockery, &c.	1,448 65
Kitchen fittings, &c.	398 78
Laundry supplies	1,004 76
Carpets	1,425 03
Repairing billiard tables	156 00
Hard coal	2,008 94
Soft coal	4,125 52
Lights and oils, &c.	1,749 02
	22,851 03
Dry goods and clothing; books and stationery, and miscellaneous :	
Boots, shoes and slippers, new and repairing	2,181 90
New clothing	3,132 89
Material for clothing	3,458 15
Hats	200 25
Notions	725 06
Books and periodicals	560 05
Stationery and postage	702 70
Freight and hauling	596 14
Incidental work	252 75
	11,809 89
Medical supplies; for individual patients and their amusement :	
Drugs and medicines	1,245 78
Alcoholic stimulants	470 40
Instruments	121 70
Board rebated	32 45
Returning eloped patients	142 00
Amusement of patients	405 58
Sending patients to their homes	161 75
Bought with patients' money	638 41
	3,218 07
Farm, garden, and stable :	
Feed for stock	5,815 63
Implements, horseshoes, &c.	405 59
Plants and seeds	1,259 22
Manures	453 98
Live stock	1,265 81
Harness and repairs	254 49
Vehicles and repairs	785 12

Repairs and improvements:

Lumber, doors, &c	\$6,852 41	
Hardware	2,426 97	
Engineer's and plumber's supplies	6,411 97	
Mason's supplies	9,053 34	
Paints, oils, and glass	2,096 79	
Roofing	1,058 75	
Iron-work	4,626 65	
Plastering	1,512 36	
Sundry small repairs	82 64	
Fire and other apparatus, boilers, &c	8,380 37	
		\$42,502 25

Salaries and wages:

Superintendent, physicians, office, &c	7,535 20	
Ward service	21,704 26	
Inside domestic service	7,665 98	
Engineer's department	3,236 14	
Farm and garden, includes also hauling stores and coal, keeping roads in order, driving out patients, &c	11,153 89	
Sunday service	750 00	
Mechanics and helpers	20,921 60	
Manufacturing clothing, bedding, &c	1,717 85	
Laundry service	2,564 84	
		77,249 76
Covered into Treasury	3 05	
Covered into Treasury	29 95	
		33 00
		<u>240,777 58</u>

Itemized receipts.

1879.		
July	1. Board paid for N. T. West	\$26 30
	4. Board paid for J. D. Harris	73 17
	4. Board paid for M. E. Cazenove	157 08
	4. Board paid for W. M. Bryant	91 00
	12. Board paid for H. Buchlers	174 70
	14. Board paid for Bryan Hall	99 60
	14. Board paid for E. E. Stone	91 65
	15. Board paid for Marine Hospital patients	485 35
	17. Board paid for C. L. Skeels	164 00
	17. Board paid for District of Columbia patients	4,210 27
	17. Board paid for Rachael Friendlich	86 43
	21. Special attendance paid for George F. Morrison	24 93
	21. Board paid for H. W. James	130 05
	24. Board paid for Mary Harris	54 62
	24. Board paid for William Prince	255 95
	25. Board paid for Henry Price	65 00
Aug.	8. Board paid for L. Stanton	65 00
	15. Board paid for R. Friendlich	32 86
	19. Board paid for J. C. Fisher	52 09
Sept.	3. Board paid for J. P. Walker	50 00
	8. Board paid for Mary A. Cooper	30 00
	16. Board paid for Ann Phillips	52 09
	18. Board paid for A. F. Brooks	10 00
	19. Board paid for Rose Amer	75 00
	22. Board paid for R. E. Johnston	200 00
	24. Board paid for F. L. Stickney	30 00
	25. Board paid for J. P. Walker	6 08
	25. Board paid for H. W. James	13 45
	27. Board paid for A. F. Brooks	10 00
	30. Board paid for J. H. Donovan	45 00
	30. Board paid for Mary De Cindry	91 00
	30. Board paid for District of Columbia patients	5,447 13
Oct.	1. Board paid for Mary Harris	37 50
	1. Board paid for Joseph D. Harris	66 75
	1. Board paid for Jane T. Case	91 00
	3. Special attendance paid for Rollin Perkins	75 00
	8. Board paid for Mary A. Cooper	28 00
	9. Board paid for E. E. Stone	111 70

1879.	
Oct.	10. Board paid for Burton Randall..... \$183 25
	10. Board paid for H. Buchlers..... 147 50
	11. Board paid for M. E. Cazenove..... 165 50
	11. Board paid for A. F. Brooks..... 20 00
	13. Board paid for Marine Hospital patients..... 508 48
	13. Special attendance paid for George F. Morrison..... 25 00
	15. Board paid for Bryan Hall..... 65 00
	15. Board paid for W. M. Bryant..... 91 00
	15. Board paid for Mary Harris..... 75 71
	22. Board paid for C. L. Skeels..... 121 20
	22. Board paid for John Weidman..... 212 50
Nov.	3. Board paid for F. L. Stickney..... 30 00
	4. Board paid for Charles K. Yancey..... 386 00
	8. Board paid for Lucy D. Stanton..... 65 00
	8. Board paid for M. R. Key..... 91 77
	12. Board paid for J. C. Fisher..... 52 00
	15. Board paid for A. F. Brooks..... 20 00
Dec.	19. Board paid for Philip Shea..... 30 00
Dec.	20. Board paid for A. F. Brooks..... 35 00
	24. Board paid for Mary De Caidry..... 91 00
	29. Board paid for Jane T. Case..... 91 00
	31. Board paid for F. L. Stickney..... 77 14
1880.	
Jan.	3. Board paid for N. T. West..... 8 75
	3. Board paid for J. Kemon..... 30 00
	6. Board paid for Rose Amer..... 80 00
	6. Board paid for H. S. Cottel..... 150 00
	8. Board paid for J. D. Harris..... 64 98
	9. Special attendance paid for Rollin Perkins..... 75 00
	10. Board paid for Mary Harris..... 100 75
	10. Board paid for A. F. Brooks..... 20 90
	12. Board paid for Bryan Hall..... 65 00
	12. Board paid for M. E. Cazenove..... 158 25
	12. Board paid for Sarah C. Wood..... 277 10
	13. Board paid for H. Buchlers..... 162 25
	13. Board paid for George F. Morrison..... 25 00
	19. Board paid for Philip Shea..... 75 00
	19. Board paid for W. M. Bryant..... 91 00
	24. Board paid for Marine Hospital patients..... 521 33
	27. Board paid for Ella C. Hough..... 30 00
	30. Board paid for Joseph P. Hutchins..... 195 00
Feb.	2. Board paid for John Weidman..... 100 50
	6. Board paid for Burton Randall..... 91 00
	7. Board paid for Margaret R. Key..... 72 55
	7. Board paid for J. C. Fisher..... 52 00
	10. Board paid for Lucy D. Stanton..... 65 00
	10. Board paid for R. E. Johnston..... 47 39
	14. Board paid for A. F. Brooks..... 35 00
	16. Board paid for District of Columbia patients..... 4,873 86
	27. Board paid for Ella C. Hough..... 10 00
	28. Board paid for William Prince..... 209 28
March	4. Board paid for George S. Gates..... 10 00
	9. Board paid for H. S. Cottel..... 112 50
	12. Board paid for William Prince..... 10 00
	16. Board paid for Henry Price..... 90 00
	17. Board paid for Charles K. Yancey..... 5 00
	17. Board paid for A. F. Brooks..... 35 00
	29. Board paid for Jane T. Case..... 91 00
	31. Board paid for Mary De Caidry..... 91 00
	31. Board paid for Ann Phillips..... 52 00
April	2. Board paid for J. D. Harris..... 82 05
	3. Board paid for Henry Price..... 25 00
	7. Special attendance paid for Rollin Perkins..... 75 00
	7. Board paid for W. M. Bryant..... 91 00
	8. Board paid for paid Mary Harris..... 81 58
	9. Board paid for Bryan Hall..... 65 00
	10. Board paid for H. Buchlers..... 175 87
	12. Board paid for District of Columbia patients..... 5,172 00
	13. Board paid for Ann Phillips..... 52 00
	15. Board paid for Marine Hospital patients..... 525 21

1880.			
April	17.	Board paid for A. F. Brooks.....	\$30 00
	19.	Board paid for C. K. Yancey.....	91 00
	24.	Special attendance paid for George F. Morrison.....	25 00
	24.	Board paid for John Weidman.....	116 25
	29.	Board paid for Angelina Reeves.....	65 00
May	6.	Board paid for M. E. Cazenove.....	159 95
	7.	Board paid for Rose Amer.....	75 00
	15.	Board paid for C. K. Yancey.....	2 00
	15.	Board paid for A. F. Brooks.....	30 00
	15.	Board paid for Henry Price.....	25 00
	17.	Board paid for Adolph Ahlers.....	10 00
	20.	Special attendance paid for Meyer Strauss.....	152 85
June	2.	Board paid for Margaret E. Key.....	65 00
	2.	Board paid for Sarah R. Cox.....	30 00
	3.	Board paid for Henry Price.....	100 00
	4.	Special attendance paid for J. C. Fisher.....	52 00
	7.	Board paid for Burton Randall.....	91 00
	12.	Board paid for A. F. Brooks.....	30 00
	30.	Board paid for Mary De Caindry.....	91 00
			<hr/>
			31, 161 87

Classified expenditures.
SUBSISTENCE.

Date.	Furnished by—	On voucher num- bered—	Flour, meal, and cereal.	Ice.	Butter, cheese, and eggs.	Fresh meats.	Smoked and salt meats.	Poultry and fish.	Tea and coffee.	Sugar and mo- lasses.	Other groceries.	Fruits and vege- tables.	Grand total.
1879.													
July 3	Louise Hill	1										\$2 34	
12	Jacob Millard	9										2 45	
25	D. J. Foley, Bro. & Co.	17							\$455 13				
31	D. J. Foley, Bro. & Co.	19				\$7 08		\$4 50					
31	D. J. Quaid	20						13 00					
31	George W. Soper	20					\$80 00						
31	J. T. Varnell	26				1, 607 50		143 50				1 70	
Aug. 5	J. H. Skidmore	30										14 00	
9	Joshua Wormley	39									\$419 86		
16	Daniel Longhrea	47											
3	J. T. Varnell	65				1, 411 30	75 00						
Sept. 4	Thomas Sheriff	67						6 00					
4	C. A. J. Williamson	68										16 00	
12	Columbus Humphrey	77											
23	Marino Humphrey	84										13 05	
26	George M. Oyster & Co.	91		\$1, 513 90								10 13	
26	J. T. Varnell	96				1, 873 23							
30	J. H. Skidmore	100						173 23					
30	Rabbitt & Crown	103										10 25	
30	Daniel Longhrea	105										60 61	
30	Great Falls Ice Company	110	\$323 23								74 48		
30	Andrews & Wade	125											
30	N. A. Poole	128											
30	G. G. Cornwell	130	\$6 37		3 40							85 88	
30	Barbour & Hamilton	131	4 87		60 96							53 13	
30	John P. Kelley	136										80 75	
30	Benj. Charlton	138	52 29									46 50	
Oct 11	Herr & Cissel	155	2, 430 50										
30	W. M. Galt & Co.	156	2, 196 23										
31	J. T. Varnell	177				1, 960 51							
Nov. 26	J. H. Crane	198										292 23	
Dec. 3	J. T. Varnell	203				1, 671 90							
5	D. J. Foley, Bro. & Co.	209										1, 023 70	
5	Lucks & Bro.	210										259 43	
5	Daniel Longhrea	212										353 10	
10	J. H. Crane	215										345 15	

Classified expenditures—Continued.

SUBSISTENCE—Continued.

Date.	Furnished by—	On voucher num-bered—	Flour, meal, and crackers.	Ice.	Butter, cheese, and eggs.	Fresh meats.	Smoked and salt meats.	Poultry and fish.	Tea and coffee.	Sugar and molasses.	Other groceries.	Fruits and vegetables.	Grand total.
1878.													
Dec. 10	A. E. Phillips	217										\$50 00	
31	J. T. Varnell	240				\$1,614 72							
31	George M. Oyster & Co.	242			\$2,029 53			\$401 92					
31	Rabbitt & Crown	243										75 05	
31	E. H. Hewitt	245						138 71				232 10	
31	J. H. Shidmore	246											
31	Andrews & Wade	248											
31	Gravel Falls Ice Company	258		\$187 70									
31	C. M. Muller & Son	267											
31	W. C. Drury & Co.	274										123 00	
1880.													
Jan. 17	W. M. Galt & Co.	290	\$724 79										
17	G. G. Cornwell	291	15 30					6 75	\$949 80	\$56 78	130 30	135 77	
17	Barbour & Hamilton	292			109 15		\$518 85	345 86	30 50	1,037 20	1,083 59	20 50	
17	Benj. Charlton	293	40 79										
17	D. J. Quaid	296						6 00					
Feb. 4	J. T. Varnell	321				1,720 20							
3	J. T. Varnell	340				1,946 85							
8	Gwynn Harris	352						157 00					
19	Schaefer & Olary	362										251 75	
26	A. G. Wall	368			2,522 80			8 00					
31	A. N. O'Sullivan & Co.	371											
31	J. T. Varnell	372				2,272 45							
31	Barbour & Hamilton	374			121 62		465 70	262 14	1,580 07	1,580 07	1,068 71	74 00	
31	J. H. Shidmore	375						74 45			180 32		
31	Daniel Louchman	380											
31	Gravel Falls Ice Company	381		78 48									
31	A. D. Daly	383			9 25								
31	G. G. Cornwell	386	6 65						599 55		129 08	159 95	
31	Andrews & Wade	396						2 13				265 40	
31	Benj. Charlton	410	91 90										
31	Rabbitt & Crown	411						158 80					
Apr. 27	Herr & Clausel	434	2,468 83										
27	W. M. Galt & Co.	437	2,032 65										
May 6	J. T. Varnell	446				2,011 20							

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Classified expenditures—Continued.
HOUSE FURNISHING, FUEL, LIGHTS, ETC.

Date.	Furnished by—	On voucher numbered—	Furniture, furnishing, &c.	Bedding.	Table and towel linen.	Utenails, crockery, &c.	Kitchen fittings, &c.	Laundry supplies.	Carpets.	Repairing billiard tables.	Hard coal.	Soft coal.	Lights, oils, &c.	Grand total.
1878.														
July 15	Johnson Bros.	10									\$1,288 97			
17	Robert Mangum	11		\$6 65										
25	E. Howard & Co.	16	\$10 00											
31	Duffur & Co.	22	36 48											
31	Dutchman Bros.	23					\$65 00							
Aug. 4	Ed. Harris.	27						\$2 75						
7	Embry & Chalmers.	29						10 00						
8	Ed. Harris.	35												
14	Johnson Bros.	38												
14	J. Farthurst, Jr., & Co.	44									709 97			
22	W. B. Williams.	51	108 00							\$156 00			\$91 50	
Sept. 1	Miller & Jones.	63												
18	J. Farthurst, Jr., & Co.	81		220 28									87 81	
18	C. Stoddard & Bro.	82						99 70						
24	Thomas Gill.	88		36 27										
25	Robert Sweeney.	89												
26	E. Weber.	92						3 60						
26	E. R. Laddery.	101		3 50										
26	E. F. Gittings.	102		96 43										
26	W. B. Moses.	106												
26	Julius Lamsburgh.	108	597 48						\$381 74					
26	L. H. Schneider & Co.	115					6 25							
26	M. W. Beveridge.	117				\$528 00								
26	T. N. Naudain.	126												
30	Lamsburgh Bros.	129		414 74	\$129 25				74 68					
30	Barbour & Hamilton.	131						26 40						
30	Barbour & Stebbins.	137												
30	F. Thompson.	153	10 00											
Oct. 2	A. H. Whitner.	154	27 50											
9	C. Stoddard & Bro.	157	408 50											
13	Duffur & Co. (Old cages).	158	25 20											
13	Washburn, Deane & Co.	160												
24	J. Farthurst, Jr., & Co.	172					23 13						62 20	
24	L. Prang & Co. (pictures).	173	95 20										26 60	147 85

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Classified expenditures—Continued.

HOUSE FURNISHING, FUEL, LIGHTS, ETC.—Continued.

Date.	Furnished by—	On voucher numbered—	Furniture, furnishing, &c.	Bedding.	Table and towel linen.	Utensils, crockery, &c.	Kitchen fittings, &c.	Laundry supplies.	Carpets.	Repairing billiard table.	Hard coal.	Soft coal.	Lights, oils, &c.	Grand total.
1890.														
Mar. 31	M. W. Beveridge.	385				\$268 21							\$40 80	
31	Francis Miller.	388												
31	Laubach & Bro.	394		\$116 05										
31	W. R. Moses.	406	\$561 13											
31	W. S. Mitchell.	412				54 00			\$7 87					
Apr. 9	Paul Hise.	422				16 40								
10	W. Beaman.	425												
21	W. B. Williams.	426	48 00											
26	H. Hoffa (clock).	428	54 00											
27	L. W. Loomis.	430												
27	Hutchinson Bros.	432				238 00	\$10 50							
27	G. M. Wight.	435	53 00											
27	Ferry & Bro.	439		221 88	\$121 71	21 00								
30	W. Beaman.	441												
May 1	H. Johnson.	443												
7	Browning & Middleton.	449						\$75 28						
11	J. H. Williams & Co.	456						12 90					153 48	
21	H. Kemp (pictures).	460	12 00											
25	E. R. Lafferty.	461		122 37										
31	Johnson Bros.	462												
31	R. H. Chase.	467	108 67									\$434 58		
12	Potomac Terra-Cotta Company.	481				6 00								
24	W. R. Williams.	489	65 00											
25	George Williams.	490		214 72										
26	G. W. Beall.	491		34 80										
28	W. B. Moses.	496	134 95											
30	C. B. Jewell.	506						632 39						
30	M. W. Beveridge.	507				181 85								
30	J. W. Bodeler & Son.	515				13 75								
30	W. H. Harrover.	520					8 00							
30	Barbour & Hamilton.	522						37 45						
30	F. Miller.	534											25 05	
30	Laubach & Bro.	539		900 14	10 40								9 00	

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Classified expenditures—Continued.

DRY GOODS AND CLOTHING, BOOKS AND STATIONERY, AND MISCELLANEOUS.

Date.	Furnished by—	On voucher numbered—	Boots, shoes and slippers (new and repairing).	New clothing.	Material for clothing.	Hats.	Notions.	Books and periodicals.	Stationery and postage.	Freight and hauling.	Incidental work, &c.	Grand total.
1879.												
July 5	James Small, testing scales	3									\$8 00	
25	A. H. Post	13						\$6 72				
31	J. H. Clark	25		\$38 00				4 03				
Aug. 18	W. C. & F. P. Church	49						2 00				
26	D. M. Stone, president	53								\$31 22		
27	Baltimore and Ohio Railroad Company	54								5 00		
28	George W. Knox	56									14 00	
29	William Shoeborn, drawings	2										
Sept. 1	C. Sheldart & Bro	61			\$247 87					74 00		
12	Baltimore and Ohio Railroad Company	76							\$1 00			
15	R. T. Petrus	78										
16	George W. Knox	79								20 00		
20	R. P. A. Denham, agent	10								27 00		
24	John Wiley & Sons	87						40 35				
30	National Republican	89						21 40				
30	B. H. Stinson	107				\$89 25						
30	James J. Chapman	120					\$274 61		63 25			
30	H. Adler, agent	121										
30	George King	122	\$7 20									
30	E. Morrison	123							17 90			
30	Perry & Bro	124		5 50								
30	C. W. Thurn & Co	127					7 65					
30	Lansburgh & Bro	129		87 00	733 78							
30	Francis Pratt	135	647 25						4 76			
30	Washington City post office	139										
30	Evening Star newspaper	140										
30	Washington Post	141										
30	Baltimore and Ohio Railroad Company	145						17 25		68 83		
30	Mechanics' Line steamers	146						82 75		4 13		
30	Clyde Line steamers	147								16 08		
30	Inland and Seaboard Coasting Company	148								8 25		
30	Alabama Express Company	149								22 30		

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Classified expenditures—Continued.
DRY GOODS AND CLOTHING, BOOKS AND STATIONERY, AND MISCELLANEOUS—Continued.

Date.	Furnished by—	On voucher numbered—	Boots, shoes, and slippers (new and repairing).	New clothing.	Material for clothing.	Hats.	Notions.	Books and periodicals.	Stationery and postage.	Freight and hauling.	Incidental work, &c.	Grand total.
1890.												
Mar. 23	T. N. Naudain	363					\$5 12	\$9 75				
31	W. H. & O. H. Morrison	379										
31	Francis Profit	382	\$322 00									
31	J. J. Chapman	384							\$18 65			
31	George King	386	92 10									
31	A. Saka & Co.	387		\$44 00								
31	B. Robinson & Co.	390		242 00								
31	Louis Baar	392					2 40					
31	Washington City post office	393							5 50			
31	Leansburgh & Bro.	394		1 25	\$151 66							
31	B. Silverberg	397					80 27					
31	National Republican	401						20 70				
31	Washington Post	402						30 50				
31	Evening Star Newspaper Company	403						21 50				
31	E. Morrison	404							16 25			
31	J. C. Maynard, telephone	405									\$15 00	
31	H. Adler, agent	408										
31	Baltimore and Potomac Railroad Company	415					175 56			\$12 35		
31	Baltimore and Ohio Railroad Company	416								6 80		
31	Adams Express Company	418								11 80		
31	R. P. A. Denham, agent	419								9 16		
31	C. Stoddart & Bro.	421		421 60								
Apr. 27	R. Cohen	431	562 28									
27	Perry & Bro.	433										
27	Baltimore and Potomac Railroad Company	439		256 56	87 50					23 43	2 00	
May 12	E. Weber, laundrying	458									9 00	
17	J. H. Woodward, repairing boilers	459										
June 4	R. C. Jones	466						6 00				
12	Robert Boyd, copper boilers	471									10 50	
12	J. T. Price & Son, canvas for inspectors	472									18 00	
12	Wheeler & Wilson Manufacturing Company	474										
12	H. L. Palmie & Son	476					75		2 00			
		483										

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Classified expenditures—Continued.
MEDICAL SUPPLIES EXPENDED FOR INDIVIDUAL PATIENTS AND THEIR AMUSEMENT.

Date.	Furnished by—	On voucher numbered—	Drugs and medicines.	Alcoholic stimulants.	Instruments.	Excess of board paid in advance and refunded.	Bought with money of patients.	Returning eloped patients.	Amusement of patients.	Sending to homes.	Total.
1870											
July											
4	John F. Hutchinson	2									
5	Lewis Beech	4						\$5 00			
5	Z. Tate	5						5 00			
10	John Owens	7						5 00			
24	W. T. Anderson	12						5 00			
25	John Tighman	14						5 00			
28	Richard Bannet	18						5 00			
31	E. A. McGirr	28						5 00			
Aug.	Henry Waddy	31					\$6 17			\$48 75	
6	A. M. Holderly	23						5 00			
7	Jeremiah Sullivan	26									
20	A. H. Witmer	59								15 00	
Sept. 1	W. M. Bryant	60				\$22 45				12 00	
1	F. M. Rowland	64								64 00	
4	Albert R.	69						5 00			
22	W. H. Christian	85						5 00			
27	J. L. Brown	83						5 00			
30	Charles Fisher	111			\$8 70						
30	Scott & Cromwell	116	\$24 60								
30	R. Cohen	118					15 50				
30	A. Saks & Co.	119					70 00				
30	G. G. Cornell	120		\$69 25							
30	Barbour and Hamilton	131		78 75							
30	S. F. Shreve	142	283 72								
30	A. H. Witmer	143									
30	W. W. Gidding	144					27 25		\$23 00		
Oct. 14	James H. Rowland	145									
102	Henry Smith	146						5 00			
20	Mary Lee	154						5 00			
20	Marri Paine	165					20 00				
20	John Connell	167						5 00			
29	Anthony Buckley, funeral	169					40 95				

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Classified expenditures—Continued.

MEDICAL SUPPLIES EXPENDED FOR INDIVIDUAL PATIENTS AND THEIR AMUSEMENT.

Date.	Furnished by—	On voucher numbered—	Drugs and medicines.	Alcoholic stimulants.	Instruments.	Excess of board paid in advance and refunded.	Bought with money of returning eloped patients.	Amusement of patients.	Sending to homes.	Total.
1879.										
July										
4	John F. Hutchinson	2								
5	Lewis Beech	4					\$5 00			
6	Z. Tate	5					5 00			
10	John Owens	7					5 00			
24	W. T. Anderson	12					5 00			
25	John Tighman	14					5 00			
28	Richard Bennett	18					5 00			
31	E. A. McGirr	26					5 00			
Aug.										
5	Henry Waddy	31							\$48 75	
6	A. M. Holderly	33					\$6 17			
7	Jeremiah Sullivan	36					5 00			
29	A. H. Witmer	59							15 00	
Sept.									12 00	
1	W. M. Bryant	60				\$22 45			64 00	
4	F. M. Rowland	64					5 00			
4	Albert Barnes	69					5 00			
22	W. H. Christian	85					5 00			
27	J. L. Brown	93					5 00			
28	Charles Fisher	111			\$6 70					
30	Stott & Cronwell	116	\$24 60							
30	R. Cohen	118					15 50			
30	A. Saks & Co.	119					70 00			
30	G. G. Cornwell	130								
30	Barbour and Hamilton	131		\$69 25						
30	S. F. Shreve	142		78 75						
30	A. H. Witmer	143	283 72							
30	W. W. Godding	144					27 25			
Oct.										
14	James H. Rowland	162								
20	Henry Smith	164					5 00			
20	Mannet Lee	165					5 00			
20	Starr Parsons	166					20 00			
20	John Connell	167								
30	Anthony Buckley, funeral	169					46 05			

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Classified expenditures—Continued.
MEDICAL SUPPLIES, &c.—Continued.

Date.	Furnished by—	On voucher numbered—	Drugs and medicines.	Alcoholic stimulants.	Instruments.	Excess of board paid in advance and refunded.	Bought with money of patients.	Returning eloped patients.	Amusement of patients.	Sending to homes.	Total.
1879.											
June 28	W. G. Metzgerott & Co.....	492					\$57 75		\$1 35		
30	A. Saks & Co.....	519									
30	Barbour & Hamilton.....	522					5 00				
30	G. G. Cornwell.....	525		\$77 87							
30	Scott & Cronwell.....	526		17 20							
30	R. Cohen.....	528	\$16 88				8 75				
30	S. F. Shreve.....	532	256 11								
30	W. W. Godding.....	548					62 42		7 00		
30	A. H. Witmer.....	554									
30	Perry & Bro.....	555					20 45				
	Total.....		1, 245 78	470 40	\$121 70	\$33 45	638 41	\$142 00	405 58	\$161 75	\$3, 218 07

Classified expenditures—Continued.

FARM, GARDEN, AND STABLE.

Date.	Furnished by—	On voucher—	Feed.	Implements, &c.	Plants and seeds.	Manures.	Live stock.	Harness and repairs.	Vehicles and repairs.	Total.
1879.										
July 25	S. T. F. Sterick	15							\$15 00	
July 31	R. H. Owen	24							41 43	
Aug. 6	Owen Cox	32			\$14 00					
Aug. 7	John E. Phillips	34					\$75 00			
8	John B. Hayes	37			41 00					
14	Peter Henderson & Co	42			45 00					
14	A. R. Venable, Jr.	45								
14	John M. Young	46					225 00		125 00	
Sept. 1	Peter Henderson & Co	62			21 78					
2	Patrick Grace	66			14 40					
2	S. F. Gardiner	73								
10	Jos Kaufman	74					55 00			
22	Evander French	86					585 00			
29	R. H. Owen	94					5 01		16 69	
30	J. T. Prior & Son	95								
30	Allison Nallor, Jr.	109				25 00				
30	John McDermott & Bro.	112				50 00				
30	F. A. Lutz & Bro.	113								
30	L. H. Schneider & Co	115						\$110 75	128 00	
30	John A. Baker	132		\$39 30	114 93					
Oct. 11	W. M. Galt & Co	156	\$559 00	46 78	42 00					
30	Paul Hiser, flower-pots	176		51 00						
Nov. 5	Thomas L. Hume	178								
11	Jos Kaufman	185					125 00			
26	Evander French	197					150 00			
Dec. 3	T. C. Westby	204		2 75			1 25			
5	John Saul	211			132 45					
18	F. W. Kelsey	221			108 25					
18	Parsons, Sons & Co	223			259 60					
22	A. J. Joyce	226								
30	T. C. Westby, bees	239					31 00		14 60	
31	J. T. Price & Sons	241								
31	Allison Nallor, Jr.	253				25 00				
31	John A. Baker	262				50 00				
31	Lutz & Bro.	264		95 94	41 50			43 19	4 25	
1880.										
Jan. 17	W. M. Galt & Co	290	1,502 65							

Classified expenditures—Continued.
FARM, GARDEN, AND STABLE—Continued.

Date.	Furnished by—	On voucher—	Feed.	Implements, horseshoes, &c.	Plants and seeds.	Manures.	Live stock.	Harness and repairs.	Vehicles and repairs.	Total.
1880.										
Feb. 9	A. J. Joyce	823							\$162 45	
9	J. H. Mitchell	325								
10	P. Henderson & Co.	333			\$51 58					
20	A. J. Root	336					\$3 55			
Mar. 2	Arch. Etzler	345							12 00	
6	Alex. Moffat	350							10 00	
9	P. Henderson & Co.	354			16 88					
10	Paul Hiser	358		6 00						
17	N. Studer	359			25 50					
31	J. T. Price & Son	373				\$25 00				
31	J. H. Mitchell	383		4 75						
31	Allison Naylor, jr	389				50 00				
31	John McDermott & Bro	395						\$38 45	74 85	
31	Lutz & Bro.	400		60 00	175 28	67 48				
31	John A. Baker	409		7 00						
Apr. 22	Paul Hiser	427			12 00					
27	C. F. Starr	429	\$2,176 48							
27	W. M. Galt & Co	437			33 00		10 00			
May 7	N. Studer	450								
8	John Hamilton	451							4 90	
10	S. A. Smith	452								
11	F. W. Kelsey	454			54 75					
12	J. T. Price & Son	474				25 00				
12	P. Henderson & Co.	482			16 00					
28	John A. Baker	496		84 07	38 72	1 50				
June 30	J. H. Mitchell	516		3 75				32 00		
30	E. L. Roland	517						24 10		
30	Lutz & Bro.	518							29 45	
30	A. J. Joyce	525								
30	Allison Naylor, jr	546				50 00				
30	W. M. Galt & Co	3	1,577 50			85 00				
30	A. J. Joyce	15							148 50	
	Total		5,815 63	405 59	1,250 22	453 98	1,265 81	254 49	785 12	\$10,239 84

Classified expenditures—Continued.
REPAIRS AND IMPROVEMENTS

Date.	Furnished by—	On voucher numbered—	Lumber, doors, &c.	Hardware.	Engineers and plumbers' supplies.	Masons' supplies, &c.	Paints, oils, glass, &c.	Roofing.	Iron work.	Plastering.	Sundry small repairs.	Fire and other apparatus, &c., boilers, and machinery.	Total.
1879.													
July 8	Joseph Adams, gas regulators	6										\$50 00	
15	do	9										200 00	
31	Howard Fleming	21					\$42 42				\$3 60	1,017 65	
Aug. 11	A. J. Fish & Co., rotary oven.	40										280 00	
11	H. P. Gilbert	41								\$153 00			
14	S. A. Wood Machine Company, planer	43											
16	J. A. Smith	48											
18	J. B. Shannon & Sons, locks	50		\$30 00									
23	R. S. Jennings, filter	52											
27	T. W. Riley & Sons	55				\$1 02							
27	Dufur & Co., wire guards	56											
27	Michael Featon, underpinning wall	57											
Sept. 8	T. B. Cross, Jr.	70	\$257 20			389 25			\$16 74			106 88	
8	Robert Leitch & Sons	71			\$530 84								
8	F. P. May & Co	72		21 06									
8	John Webster, bricks	75				600 00					36 00		
17	B. Tully	80											
20	D. McMenamin, stone sills	83				87 50						862 00	
26	S. L. Holt & Co., engine	90											
30	Barber & Henderson	98											
30	G. C. Maynard	99	87 30										
30	Francis Miller	104		13 20									
30	F. E. Hamilton	114					24 12						
30	L. H. Schneider & Co.	115			133 63								
30	Thomas Somerville	133		425 23									
30	Robert Leitch & Son	134			205 83								
30	Bassbor & Stebbins	137			108 87								
30	Bassbor & Stebbins	137			420 82								
Aug. 18	Bangor Extension Ladder Co., ladders	1											
Sept. 4	Sutherland Falls Marble Co., marble tile	3				190 00						350 80	
4	W. G. H. Clarkson, lime	4	458 10			214 50							
8	T. B. Cross, Jr.	5											
8	Robert Leitch & Sons	6			330 26								

Classified expenditures—Continued.
REPAIRS AND IMPROVEMENTS—Continued.

Date.	Furnished by—	On voucher number—	Lumber, doors, &c.	Hardware.	Engineers and plumbers' supplies.	Masons' supplies.	Paints, oils, glass, &c.	Roofing.	Iron work.	Plastering.	Sundry small repairs.	Fire and other apparatus, etc., boilers, and machinery.	Total.
1870.													
Sept. 9	W. O. Avery	7							\$294 56			\$50 00	
16	White & Bro., window-heads	8											
19	Foster Henshaw	9			\$10 00					\$108 00			
27	John A. Smith	11								20 00			
27	do	12											
30	Knowles Steam Pump Co., fire-pump.	13											
30	Baldwin Bros., doors	14	\$289 00										
30	G. A. Shehan	15	18 00									1,725 00	
30	S. F. Shreve	16											
30	Willet & Libbey	17	102 60				\$368 67						
30	Bassher & Stebbins, pipe	18											
30	J. T. Campbell, lime	19			1,189 02								
30	John Brooks, sand	20				\$64 80							
July 8	D. McManamin, sills	1				23 14							
14	John Webster, bricks	2				49 00							
26	W. G. H. Clarkson, lime	3				1,200 00							
Ang. 7	J. T. Campbell, lime	4				224 25							
Sept. 2	William Owden, sand	5				56 45							
2	T. E. Cross	6				10 50							
8	Robert Leitch & Sons	7	1,170 25										
8	John Webster, bricks	8			330 23								
11	D. McManamin, stone sills	9				1,500 00							
20	Campbell & Kennedy	10				36 08							
30	W. G. H. Clarkson, lime	11		\$377 09									
30	S. M. Grout, sand	12				105 75							
30	Jos. & J. E. Libbey	13				99 30							
30	Jos. Adams, gas regulators	14	104 01										
Oct. 14	John Webster, bricks	161				504 65						40 00	
16	Foster Henshaw, filter	163										69 17	
21	W. W. Tupper & Co., grate-bars	166										146 88	
24	William Scherer & Co., pulley	170										30 70	
Nov. 8	J. T. Campbell	171				67 25							

[illegible]

Classified expenditures—Continued.
REPAIRS AND IMPROVEMENTS—Continued.

Date.	Furnished by—	On voucher numbered—	Lumber, doors, &c.	Hardware.	Engineers' and plumbers' supplies.	Masons' supplies.	Paints, oils, glass, &c.	Roofing.	Iron work.	Plastering.	Sundry small repairs.	Fire and other apparatus, &c., boilers, and machinery.	Total.
1880.													
Mar. 3	J. W. Sheekella.....	348									\$1 50	\$25 00	
9	C. A. J. Williamson.....	355					\$58 22						
31	Francis Miller.....	398		\$290 78									
Feb. 31	L. H. Schneider & Co.....	413											
4	Barber, Henderson & Co.....	31	\$307 98			\$20 75							
16	W. T. Campbell.....	32				43 50							
18	W. G. H. Clarkson.....	33				35 25							
Mar. 24	do.....	34											
25	T. R. Cross, Jr.....	35	114 66										
25	Waldwin Bros.....	36	575 50										
31	W. G. H. Clarkson.....	37				45 00							
31	Y. T. Walker's Sons.....	38				3 00							
31	Y. T. Campbell.....	39				33 25				\$250 00			
31	Y. A. Smith.....	40											
Jan. 22	T. R. Cross, Jr.....	37	313 61			15 29							
24	J. B. Cross.....	38											
Feb. 4	J. McKenamin.....	39		81 30									
6	Barber, Henderson & Co.....	30	127 25								19 39		
8	Campbell & Kennedy.....	41											
20	American Saw Co.....	42	54 00										
23	Waldwin Bros.....	43			\$6 60								
27	Washburn & Stebbins.....	44											
31	Jos. & J. E. Libbey.....	45	33 79		15 00								
31	Hamilton & Shedd.....	46				120 35							
31	Walker & Co., tiling.....	40			260 86								
31	R. Leitch & Sons.....	47			10 24								
31	C. A. Schneider & Sons.....	48				852 06							
31	John Webster, bricks.....	424					865 19						
Apr. 27	J. E. Shreve.....	436											
27	do.....	437											
May 7	W. G. H. Clarkson.....	438			389 54					52 50			
7	Washburn & Stebbins.....	444			6 60								
11	Stone & Westervelt.....	447											
		453											\$ 76

Date	No.	Name	171 86	50 80	171 86	8 70	25 30	45 65	55 91 8 75	57 04	10 00	858 82	8905 41 1,729 38	1,619 36	89 84	171 86	8,380 37	\$42,502 25
June 1	467	J. B. Shannon & Sons, locks																
June 2	468	S. L. Holt & Co., lathe		50 80														
June 12	476	G. A. Sheban				8 70												
June 13	477	E. G. Wheeler																
June 12	478	Gray & Noyes					25 30											
June 12	484	George Rynear, Jr						45 65										
June 16	487	G. Vanderweken, stone			85 40				55 91 8 75									
June 28	488	Campbell & Kennedy																
June 28	489	T. Timney, marble																
June 30	510	W. G. H. Clarkson																
June 30	521	George White & Co., gas retorts				197 47				57 04								
June 30	520	Thomas Somerville																
June 30	533	L. H. Schneider & Co			501 57													
June 30	534	F. Miller				243 59												
June 30	541	Baschur & Stebbins																
June 30	545	B. Tulley						27 50										
June 30	553	J. T. Campbell																
June 30	560	T. B. Cross, Jr		112 68														
June 27	42	Aires & Belf		29 49														
June 12	43	John A. Smith																
June 24	44	James Murtaugh		218 86														
June 12	45	Dufur & Co																
June 30	1	Pattit & Dripps																
June 30	6	S. F. Shreve				100 65				257 46								
June 30	7	E. P. Gleason Manufacturing Company																
June 30	8	T. B. Cross, Jr		700 40														
June 30	10	Jos. & J. E. Libbey		27 87														
June 30	11	John Webster				54 30		80 00										
June 30	12	R. Leitch & Son				84 00												
June 30	16	Hamilton & Sheild																
Total			2,428 97	6,552 41	9,083 34	2,006 79	\$1,058 75											

Classified expenditures—Continued.
SALARIES AND WAGES.

Date.	On voucher numbered—	General office, superintendent, physicians, &c.	Ward service.	Inside domestic department.	Engineer's department.	Farm and garden hauling, hauling coal, driving, &c.	Sunday service.	Mechanics and helpers.	Manufacturing clothing, bedding, &c.	Laundry.	Grand total.
1879.											
Sept. 30	Pay-roll, support.	\$2,036 20	\$5,317 62	\$450 50	\$598 02	\$249 28	\$37 50	\$3,791 43	\$127 50	\$908 09	
80	do.		103 50	1,374 63		2,254 71		84 70			
80	W. H. Mullan.							313 00			
80	Pay-roll, repairs.							5,491 83			
Nov. 29	Pay-roll, relief building.										
Dec. 8	G. H. Arnold.	25 00									
21	George Hartig.										
81	Pay-rolls.	1,759 84	5,378 38	705 00	829 61	212 12	87 50	2,065 73	285 50	25 00	
81	do.			1,184 68		2,941 20		1,929 78	90 00	644 80	
81	Pay-roll, repairs.							1,889 06			
31	Pay-roll, relief building.										
1880.											
Mar. 31	do.	1,778 13	4,286 83	419 00		247 67	37 50		189 00		
81	do.		1,299 23	1,511 33	849 85	2,364 68		1,030 17	183 03	629 85	
31	do.							1,476 24	90 00		
31	do.							401 82			
31	do.								25 00		
May 1	J. W. Ball.						100 00				
June 28	John Cheeser.						100 00				
28	J. G. Butler.						100 00				
28	A. F. Steele.						100 00				
28	J. W. Parker.						100 00				
28	S. F. Ryan.						100 00				
28	John Lanahan.						100 00				
30	Jacob Millard.										
80	Pay-roll.	1,036 03	4,187 68	470 00		27 00	37 50		162 09		
80	do.		1,201 03	1,550 84		264 56			203 80	657 00	
80	do.					2,682 86		1,050 67	90 00		
80	W. H. Topping.				839 56						
80	H. F. Furringer.				119 00			17 85			
80	Pay-roll.							1,377 82			
	Total.	7,835 30	21,704 26	7,665 96	8,280 14	11,158 89	750 00	20,921 60	1,717 85	2,664 84	\$77,340 76

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

OFFICERS OF THE INSTITUTION.

Patron.—RUTHERFORD B. HAYES, President of the United States.
President.—EDWARD MINER GALLAUDET, Ph. D., LL. D.
Secretary.—HON. WILLIAM STICKNEY.
Treasurer.—GEORGE W. RIGGS, Esq.

Directors.—HON. THOMAS F. BAYARD, Senator from Del.; HON. JOHN T. HARRIS, M. C., from Va.; HON. WILLIAM CLAFLIN, M. C., from Mass.; representing the Congress of the United States. HON. HENRY L. DAWES, of Mass.; HON. WILLIAM E. NIBLACK, of Ind.; REV. BYRON SUNDERLAND, D. D.; JAMES C. MCGUIRE, Esq.; HON. HENRY D. COOKE.

COLLEGE FACULTY.

President and Professor of Moral and Political Science.—EDWARD M. GALLAUDET, Ph. D., LL. D.
Professor of Mental Science and English Philology.—SAMUEL PORTER, M. A.
Professor of History and Languages.—EDWARD A. FAY, M. A.

Professor of Natural Science.—REV. JOHN W. CHICKERING, JR., M. A.
Professor of Mathematics and Chemistry.—JOSEPH C. GORDON, M. A.
Assistant Professor of History and English.—J. BURTON HOTHCHRISS, M. A.
Assistant Professor of Mathematics and Latin.—AMOS G. DRAPER, M. A.

FACULTY OF THE PRIMARY DEPARTMENT.

President.—EDWARD M. GALLAUDET, Ph. D., LL. D.
Instructors.—JAMES DENISON, M. A., Principal; MELVILLE BALLARD, M. S.; THEODORE A. KIESEL.

Instructor in Articulation.—MARY T. G. GORDON.

DOMESTIC DEPARTMENT.

Supervisor.—JOHN B. WIGHT.
Attending Physician.—N. S. LINCOLN, M. D.
Matron.—MISS ANNA A. PRATT.

Assistant Matron.—MISS MARGARET ALLEN.
Master of Shop.—ALMON BRYANT.
Steward.—H. M. VAN NESS.

TWENTY-THIRD ANNUAL REPORT OF THE COLUMBIA INSTITUTION FOR THE DEAF AND DUMB.

COLUMBIA INSTITUTION FOR THE DEAF AND DUMB,
Kendall Green, near Washington, D. C., October 29, 1880.

SIR : In compliance with the acts of Congress making provision for the support of this institution, we have the honor to report its progress during the year ending June 30, 1880.

NUMBER OF PUPILS.

The pupils remaining in the institution on the 1st of July, 1879, numbered.....	75
Admitted during the year.....	25
Since admitted.....	28
Total	128

Under instruction since July 1, 1879, males, 120 ; females, 8 ; of these 79 have been in the collegiate department, representing 24 States and the Federal District, and 49 in the primary department. A list of the names of the pupils connected with the institution, since July 1, 1879, will be found appended to this report.

HEALTH OF THE INSTITUTION.

General good health has prevailed in the institution since the date of our last report, and the few cases of sickness that have occurred yielded to treatment, with a single exception.

Quite a number of the pupils have suffered from maladies of the eye and ear. In every instance, however, these difficulties have been successfully treated by Dr. Francis B. Loring, of Washington.

DEATH OF MOSES ROBINSON.

Moses Robinson, a pupil of our primary department, from the District of Columbia, was attacked, in August last, with hemorrhages from the lungs. With an inherited tendency to pulmonary disease, his recovery from this illness was only partial, and it soon became evident that he was in quick consumption. He died on the 23d instant, having failed in strength steadily from the time he was taken sick. His record as a pupil was that of a boy who tried to do his duty. Through all his suffering he was patient and cheerful, and when it became certain that he could not recover, he did not murmur at the will of God, for he had earned to trust Him as a loving father and an all-sufficient Saviour.

CHANGES IN CORPS OF INSTRUCTORS.

Mr. Wilbur N. Sparrow, a graduate of our college, B. A., 1877. who or the past two years has been an instructor in our primary depart-

ment, resigned his position last June. Mr. Sparrow had performed his duties in a most satisfactory manner, and carries with him in his retirement the best wishes of all with whom he was associated. Mr. Theodore A. Kiesel, of Delaware, a member of the present senior class in the college, has been employed to succeed Mr. Sparrow.

COURSES OF INSTRUCTION.

The work of instruction in the several departments of the institution has proceeded with no essential changes, the courses of instruction remaining substantially the same as described in former reports.

Articulation has been continued with the pupils of the primary department, an increased number receiving the benefits of instruction in this branch. The results are highly encouraging, so much so as to suggest the employment of a second instructor in articulation at no distant day.

LECTURES.

The following lectures have been given by the professors and instructors in the two departments.

To the students of the collegiate department :

The Monroe Doctrine and the Panama Canal ; President Gallaudet.

Books ; Professor Porter.

Origin of the French Language ; Professor Fay.

Views of Ireland and Scotland, and the Yosemite Valley, given with the magic lantern ; Professor Chickering.

Lessons from Chemical Recreations ; Professor Gordon.

Athletic sports among the Ancient Greeks ; Assistant Professor Hotchkiss.

The Roman Calendar and manner of dividing time ; Assistant Professor Draper.

To the pupils of the primary department : A course on Natural Philosophy, by Mr. Denison. A course on Physical Geography, by Mr. Ballard. A course on Geology, by Mr. Sparrow.

EXERCISES OF PRESENTATION DAY.

The exercises of the regular public anniversary of our collegiate department took place on the 5th day of May in the chapel of the institution. The President of the United States, in his capacity as patron of the institution, occupied the chair. The exercises were opened with prayer by the Rev. Samuel H. Green, pastor of Calvary Baptist Church, Washington, D. C.

The candidates for degrees delivered essays as follows :

Oration : The Elizabethan Age of English Literature ; James Irvin Sansom, Pennsylvania.

Dissertation : Benjamin West ; Arthur Dunham Bryant, District of Columbia.

Oration : Man in his Threefold Nature ; Lester Goodman, Illinois. Messrs. Goodman and Sansom were presented by the president of the college to the board of directors as candidates for the degree of bachelor of arts. Mr. Bryant was presented as a candidate for the degree of bachelor of philosophy.

President Gallaudet then introduced Mr. Alexander Graham Bell, lecturer on speech in the Johns Hopkins University, and the distinguished inventor of the telephone, referring to the important service

Mr. Bell had rendered the cause of deaf-mute education by the adaptation of his father's invention of *visible speech* to the instruction of deaf-mutes in articulation.

Mr. Bell then delivered a very interesting address on *Melville Bell's visible speech*, explaining the process by which deaf-mutes are taught to speak by the aid of this very valuable discovery.

President Gallaudet then introduced the Hon. J. Randolph Tucker, Member of Congress from Virginia, who addressed the graduating class, and expressed in earnest and eloquent language his interest in and approval of the work of the college.

In pursuance of votes of the board of directors, the following honorary degrees were conferred :

Master of arts on Edmund Booth, editor of the *Anamosa Eureka*, Anamosa, Iowa, an early graduate of the Hartford Institution for the Deaf and Dumb, and for many years a successful editor in the West.

Doctor of philosophy on Alexander Graham Bell, in recognition of his important services in the cause of deaf-mute education, and his well-deserved renown as a scientific discoverer.

The exercises of the day were closed with the benediction by Rev. C. K. Marshall, D. D., of Mississippi.

At the close of the academic year, on the 23d of June, degrees were conferred in accordance with the recommendations of presentation day. The degree of bachelor of arts was also conferred on Henry White, of Massachusetts. From the primary department, Margaret Ryan and Edward Carter, of the District of Columbia, and Wilbur Fish Bateman, of Ohio, were graduated with suitable diplomas. Frederick C. Cook, of New York, Paul S. Morley, of Pennsylvania, and Frederick W. Wood, of Massachusetts, were promoted to the collegiate department at the opening of the present term.

MEDAL FROM THE PARIS EXPOSITION OF 1878.

The work of our collegiate department received a gratifying recognition during the year now under review, in a diploma and silver medal from the Paris Universal Exposition of 1878. The delay in receiving these distinctions grew out of a misunderstanding as to the correct name of the college; the word *Columbia* in the corporate title of the institution having been incorrectly applied to the college.

INTERNATIONAL CONVENTION OF INSTRUCTORS OF THE DEAF AND DUMB AT MILAN, ITALY.

As authorized and directed by a resolution of the board, adopted in April last, the president during the past summer visited Europe for the purpose of attending an international convention of instructors of the deaf and dumb, invited to meet at Milan, Italy, on the 6th day of September.

This convention was composed of 164 members, of which number 87 were from Italy, 56 from France, 8 from England, 5 from the United States, 3 from Scandinavia, 3 from Germany, 1 from Belgium, and 1 from Switzerland.

The subject which occupied the attention of the convention to a greater extent than any other was, the instruction of the deaf in articulation.

The two institutions of Milan have been laboring most assiduously

during the past few years for the development of speech and lip-reading among their pupils.

The ample means at their command have enabled them to assign a teacher to every eight pupils; the proportionate number of teachers being thus double that provided in the majority of American institutions. This great advantage, taken in connection with the peculiar ease with which Italian speech may be acquired by deaf-mutes, has enabled the Milan school to succeed in imparting speech and lip-reading to a much larger proportion of their pupils than has heretofore been considered possible in articulating schools for the deaf.

These results were brought prominently to the attention of the convention in a variety of ways, and exerted so great an influence that it was not difficult for those who were interested in the pure oral method to secure the adoption of such resolutions as they desired to have passed.

Instructors of long experience in England, France, Belgium, Sweden, and the United States urged the claims of the *combined system*, in which articulation is accorded all due prominence, but in which the language of signs and the manual alphabet are made use of as adjuncts too valuable to be dispensed with.

Their views, however, did not prevail, and the convention, by a large majority, adopted the following resolutions:

"I. The convention, considering the incontestable superiority of speech over signs, (1) for restoring deaf-mutes to social life; (2) for giving them greater facility of language, declares that the method of articulation should have the preference over that of signs in the instruction and education of the deaf and dumb.

"II. Considering that the simultaneous use of signs and speech has the disadvantage of injuring speech and lip-reading and precision of ideas, the convention declares that the pure oral method ought to be preferred."

The recommendations of these resolutions are, in our opinion, wholly inadequate to meet the wants of all the deaf and dumb. No fact is more plainly established than that a very large proportion of this class of persons cannot be taught to speak and to read from the lips *well*. And it is the judgment of many instructors of the largest experience, both in America and in Europe, that time and money are wasted in an attempt to impart speech to such as are plainly incapable of achieving anything more than a very partial success.

The resolutions of the Milan convention are, in our opinion, open to the very serious criticism of disingenuousness, for they recommend an entire abandonment of signs in the instruction of the deaf; while, in the debate which preceded their adoption, many supporters of the "pure oral method" freely acknowledged that they used signs to a certain extent, but voted down a resolution which recognized this fact.

Now the combined system, which has been advocated by the officers of this institution for the last thirteen years, welcomes every practicable means of advancing and perfecting the education of all the deaf and dumb. The supporters of this system do not object to the establishment of schools in which the "oral method" may be employed, provided that at the same time other schools can be maintained for the benefit of those who are incapable of success in speech. What is objected to most strenuously is that a procrustean method should be insisted on, the general adoption of which would not fail to bring disappointment and serious loss to many who under a system adapted to their needs might reach satisfactory results.

Among the subjects discussed at the Milan convention was that of the collegiate education of the deaf and dumb. No high schools or colleges for deaf-mutes have been as yet established in Europe, and naturally the convention listened with great interest to a paper presented by the president of this institution, giving an account of the practical solution of the question of higher education, in the successful operation for now sixteen years of our collegiate department.

The example of liberal benevolence presented by the United States in the support of this institution will, without doubt, have its effect in due time on our sister nations.

RECEIPTS AND EXPENDITURES.

The receipts and expenditures for the year now under review will appear from the following detailed statements:

SUPPORT OF THE INSTITUTION.

Receipts.

Balance from old account.....	\$428 67
Received from Treasury of United States.....	50,000 00
Received for board and tuition.....	1,601 00
Received from manual labor fund.....	296 50
Received for books and stationery sold.....	386 80
Received for work done in shop.....	40 40
Received from sale of live stock.....	171 53
Received from sale of gas.....	125 00
Received for damage to grounds.....	75
Received from pupils for shoe repairs.....	36 18
Received from sale of milk and sugar.....	192 64
Received from sale of wheat.....	113 12
Received from sale of old pumps and lead.....	25 36
Received from sale of produce.....	21 47
Received from sale of ashes, soap-grease, &c.....	11 24
Received from sale of mattress and old carpets.....	37 41
Received from sale of lumber.....	5 00
Received from sale of old carriage.....	25 00
Received for witness fees—A. Bryant.....	5 00
	<hr/>
	53,522 06

Disbursements.

Expended for salaries and wages.....	29,444 48
Expended for groceries.....	2,613 52
Expended for meats.....	4,033 12
Expended for potatoes.....	422 02
Expended for incidental and household expenses, marketing, &c.....	2,229 24
Expended for butter and eggs.....	2,229 98
Expended for fuel.....	1,685 90
Expended for bread.....	1,258 36
Expended for repairs on buildings.....	541 06
Expended for furniture.....	521 63
Expended for live stock.....	295 50
Expended for expenses of directors' meetings.....	10 31
Expended for books and stationery.....	849 96
Expended for farm tools, seed and feed.....	662 08
Expended for lumber.....	501 30
Expended for printing.....	168 15
Expended for ice.....	124 22
Expended for drugs and chemicals.....	194 00
Expended for carriage and wagon repairs.....	172 90
Expended for entertainment of pupils.....	57 38
Expended for illustrative apparatus.....	32 26
Expended for blacksmithing.....	66 50
Expended for harness and repairs.....	65 27

Expended for hardware.....	\$507 94
Expended for rent of telephones and putting in alarm bells	171 55
Expended for plumbing and tin work	752 00
Expended for dry goods and shoes.....	330 66
Expended for medical and surgical attendance	540 51
Expended for photographs of buildings	78 50
Expended for gas.....	1,057 52
Expended for sand, plaster, &c	46 60
Expended for paints.....	350 57
Expended for flowers, plants, &c.....	130 51
Expended for freights	18 53
Expended for shoe repairs and clothing.....	21 25
Expended for board and care of pupils at institution for feeble-minded children	105 00
* Balance unexpended	1,231 69
	<hr/> 53,522 06

ESTIMATES FOR NEXT YEAR.

The following estimates for the service of the fiscal year ending June 30, 1882, have already been submitted:

For the support of the institution, including salaries and incidental expenses—\$500 for books and illustrative apparatus, and \$2,500 for general repairs—\$53,500.

For the completion and fitting up of the gymnasium, for the erection of a farm-barn, cow-houses, hog-pens, &c., and for the inclosure and improvement of the grounds, \$15,242.07, viz:

For the gymnasium	\$3,242 07
For the farm-barn, &c.....	4,000 00
For the improvement, &c., of the grounds.....	3,000 00
	<hr/> 15,242 07

The estimate for current expenses is of the same amount as that appropriated for the current fiscal year. The number of our pupils will be somewhat increased, and under new legislation, which will be cited below, we are required to meet the expense of the education of the feeble-minded children of the District of Columbia. We entertain the hope, however, that for the year ending June 30, 1882, we may be able, by the use of close economy, to avoid a deficiency.

Congress at its last session appropriated the sum of \$5,000 towards the erection of a gymnasium, this sum being very much less than the amount of the estimate submitted for the completion of the work. With the sum allowed us we have laid the foundation of the entire building, have erected the walls of the principal section, and will roof-in that portion of the building before winter. Work will then be suspended until Congress acts upon the estimate now pending. With the sum asked for we shall be able to complete the building, provide it with the necessary fixtures, and make it in every respect ready for use.

The estimate for a farm-barn, &c., we beg leave to urge very earnestly. The buildings now made use of were erected many years ago, before the ground on which they stand became the property of the institution. They are little more than sheds, and are entirely insufficient for the needs of our farm and dairy service.

The last item in the estimates—for the improvement and inclosure of the grounds—is needed to continue work which has been in progress for the past three or four years, the importance of which has been very fully set forth in former reports.

* NOTE.—A purchase of coal was made shortly before the close of the fiscal year that exhausts this unexpended balance.

EDUCATION OF THE FEEBLE-MINDED.

In the act making appropriations for the sundry civil expenses of the government, approved June 16, 1880, the following paragraph is attached to the clause providing for the support of this institution :

Provided, That when any indigent applicant for admission to the institution belonging to the District of Columbia, and being of teachable age, is found on examination by the president of the institution to be of feeble mind, and hence incapable of receiving instruction among children of sound mind, the Secretary of the Interior may cause such person to be instructed in some institution for the education of feeble-minded children in Pennsylvania or in some other State, at a cost not greater for each pupil than is or may be for the time being paid by such State for similar instruction, and the sum necessary therefor is appropriated out of the sum above provided for current expenses of the institution.

One applicant has taken advantage of this provision, and has been placed in the Pennsylvania Training School for Feeble-Minded Children, at Media, near Philadelphia. Dr. Kerlin, who has charge of the institution, reports very favorable development, and gives reason to hope that the child will be greatly improved within a reasonable time.

EDUCATION OF THE BLIND.

Appended to this report will be found a statement from F. D. Morrison, superintendent of the Maryland Institution for the Blind, as to the number of United States beneficiaries in that institution during the past year and as to the progress they have made. These blind children are in the Maryland Institution under the provisions of section 4869 of the Revised Statutes, and with the approval of the president of this institution, as required by law.

All of which is respectfully submitted by order of the board of directors.

EDWARD M. GALLAUDET,
President.

Hon. C. SCHURZ,
Secretary of the Interior.

APPENDIX.

STATEMENT CONCERNING THE EDUCATION OF THE BLIND IN THE DISTRICT OF COLUMBIA.

DEAR SIR: There were twenty United States beneficiaries in attendance during our school year ending June 30, 1880.

John F. Germüller.
Nicholas Klug.
Harry K. L. Johnson.
Robert W. Swann.
Edward McGill.
Frank Holle.
William E. Hall.
William Joseph Donnell.
Chase Goss.
Lewis B. Mankin.

Richard W. Fenton.
Wren Trammel.
Lena Reith.
Alice C. Murry.
Louisa Smith.
Julia Stewart.
Kate Goepfel.
Catharine Grady.
Clara Davis.
Hattie Keim.

Of this number John F. Germüller, Alice C. Murry, and Lena Reith graduated at the close of the session, having completed the full course, including music. William Joseph Donnell and William E. Hall, having taken a partial course, withdrew from school, the former to engage in teaching music and tuning pianos, and the latter to open a mattress and broom factory in Washington City. Miss Murry and Mr. Germüller deserve special mention for their attainments in music.

The other fifteen pupils have been industriously pursuing the various branches taught in the institution. Every facility is afforded for obtaining a thoroughly practical education in literature, music, and such branches of handicraft as have been found best suited to the blind. Our music department is well supplied with instruments, including a grand organ with hydraulic attachment.

The shops for mechanical training are large and comfortable, and are supplied with suitable machinery and competent teachers.

The government of the institution its parental in is character. While instructing our pupils in literature, music, and handicraft, health and morals are not neglected. Although the institution is non-sectarian, all are required to attend some church selected by their parents or guardians.

The past year has been one of the most satisfactory in our history as a school, the pupils having manifested more than usual industry and perseverance, and several promise to become bright scholars.

Very respectfully,

F. D. MORRISON,
Superintendent.

E. M. GALLAUDET, LL. D.,
President of the Columbia Institution for the Deaf and Dumb.

CATALOGUE OF STUDENTS AND PUPILS IN THE COLLEGE.

From Alabama.—Colin Johnson Daughdrill.

From Delaware.—Theodore A. Kiesel.

From Florida.—Willis L. Ambrose.

From Illinois.—James Henry Cloud, Charles Chester Codman, Lester Goodman, John Wesley Hammack, Alvah Jeffords, George Ashton Keller, Thomas Lynch.

From Indiana.—John Miher Brown, Philip Joseph Hasenstab, Charles Kerney, Nathaniel Field Morrow.

From Iowa.—William Austin Nelson.

From Kentucky.—Edward Oliver Herr, Matthew Dillard Lyon.

From Maryland.—John Alexander Trundle, George W. Veditz.

From Massachusetts.—Harry Everett Babbitt, Alvah Warren Orcutt, Albert Samuel Tafts, Henry White, Frederick William Wood.

From Michigan.—Edward Louis Van Damme.

From Minnesota.—Jeremiah P. Kelley, Marshal Oscar Robert, James Lewis Smith, Anson Randolph Spear.

From Mississippi.—Charles Warren Carraway.

From Missouri.—George Thomas Dougherty.

From Nebraska.—Charles Wesley Collins, Elliott Scott Waring.

From New Jersey.—Samuel Gaston Davidson.

From New York.—Fred. C. Cook, Thomas Francis Fox, Martin James Kendrick, John Gordon Saxton.

From New Hampshire.—William E. White.

From North Carolina.—Albert Johnson Andrews.

From Ohio.—Charles Solomon Deem, Hugh Robert Drake, James Gilbert, jr., James Finley Haskins, Joseph Winton Leib, John Sereno Leib, Richard L. H. Long, Collins Stone Sawhill, Albert Henry Schory, Frank Wiley Shaw, Robert Newton Stevenson, John Joachim Viets.

From Pennsylvania.—Alvin Winelbreit Anthony, Brewster Randall Allabough, William Brookmire, Samuel S. Haas, Jacob Mitchell Koehler, William Albert Miles, Paul Shakespeare Morley, James Irvin Sanson, Lincoln Smith, Frank Widaman, Robert Middleton Zeigler.

From South Carolina.—Thomas Hines Coleman.

From Tennessee.—Isaac Newton Hammer, Lewis Arthur Palmer.

From Virginia.—John Almon Starkes.

From West Virginia.—George Layton.

From Wisconsin.—Lars M. Larson, Harry Reed, Warren Robinson, Eric L. Sampson, Frederick Stickles.

From the District of Columbia.—Arthur Dunham Bryant, Charles Clifford Griffin, George C. Sawyer, William Allen Tilley.

IN THE PRIMARY DEPARTMENT.

Females.

Louisa Tocum Fisher.....	District of Columbia.
Katie Fogarty.....	District of Columbia.
Ollie Dorsey Linthicum.....	District of Columbia.
Margaret Ryan.....	District of Columbia.
Gertrude Schofield.....	District of Columbia.
Eliza Thompson.....	District of Columbia.
Laura Alice Turner.....	District of Columbia.
Clara V. White.....	District of Columbia.

Males.

Wilbur F. Bateman.....	Ohio.
Andrew L. Boyd.....	Virginia.
Enoch G. Carroll.....	District of Columbia.
Edward Carter.....	District of Columbia.
William H. Cattlett.....	District of Columbia.
Ray Cone.....	Virginia.
Fred. C. Cook.....	New York.
John Francis Craig.....	District of Columbia.
Josiah Cuffy.....	Fortress Monroe.
Robert W. Dailey.....	District of Columbia.
David J. Downing.....	Delaware.
Timothy Hyde.....	Delaware.
Jeremiah P. Hyde.....	Delaware.
Charles H. Keyser.....	District of Columbia.
William Kohl.....	District of Columbia.
Charles E. D. Krigbaum.....	District of Columbia.
Frank A. Leitner.....	Maryland.
George M. Leitner.....	Maryland.
Joseph Lyles.....	District of Columbia.
James D. Lane.....	Virginia.
John A. Lynch.....	Delaware.
William E. Mason.....	Virginia.
John O'Rourke.....	District of Columbia.
Charles E. Park.....	Pennsylvania.
Columbus A. Rhea.....	District of Columbia.
William J. Rich.....	District of Columbia.
Moses Robinson.....	District of Columbia.
Erving H. Starkes.....	Virginia.
James Smith.....	District of Columbia.
John W. L. Unsworth.....	District of Columbia.

REGULATIONS.

I. The academic year is divided into three terms, the first beginning on the Thursday before the last Thursday in September, and closing on 24th of December; the second beginning the 2d of January, and closing the last of March; the third beginning the first of April, and closing the Wednesday before the last Wednesday in June.

II. The vacations are from the 24th of December to the 2d of January, and from the Wednesday before the last Wednesday in June to the Thursday before the last Thursday in September.

III. There are holidays at Thanksgiving and Easter.

IV. The pupils may visit their homes during the regular vacations, and at the above-named holidays, but at no other time, unless for some special, urgent reason, and then only by permission of the president.

V. The bills for the maintenance and tuition of pupils supported by their friends must be paid semi-annually in advance.

VI. The charge for pay-pupils is \$150 each per annum. This sum covers all expenses in the primary department except clothing, and all in the college except clothing and books.

VII. The Government of the United States defrays the expenses of those who reside in the District of Columbia, or whose parents are in the Army or Navy, provided they are unable to pay for their education. To students from the States and Territories who have not the means of defraying all the expenses of the college course, the board of directors renders such assistance as circumstances seem to require, as far as the means at its disposal for this object will allow.

VIII. It is expected that the friends of the pupils will provide them with clothing, and it is important that upon entering or returning to the institution they should be supplied with a sufficient amount for an entire year. All clothing should be plainly marked with the owner's name.

IX. All letters concerning pupils or application for admission should be addressed to the president.

X. The institution is open to visitors during term time on Thursdays only, between the hours of 10 a. m. and 3 p. m. Visitors are admitted to chapel services on Sunday afternoons, at a quarter past three o'clock.

XI. Congress has made provision for the education, at public expense, of the indigent blind and the indigent feeble-minded of teachable age belonging to the District of Columbia.

Persons desiring to avail themselves of these provisions are required by law to make application to the president of this institution.

REPORT

OF THE

FREEDMEN'S HOSPITAL AND ASYLUM.

FREEDMEN'S HOSPITAL,
Washington, D. C., October 1, 1880.

SIR: I have the honor to present the annual report of the Freedmen's Hospital and Asylum for the fiscal year ending June 30, 1880, as follows:

The whole number of patients in hospital during the year was 1,119, viz:

Remaining in hospital June 30, 1879	217
Admitted to hospital during the year, viz:	
Males, white	250
Females, white	37
Born in hospital, viz:	
Males, white	0
Females, white	4
Whole number of white	291
Admitted to hospital during the year, viz:	
Males, colored	253
Females, colored	219
Born in hospital, viz:	
Males, colored	25
Females, colored	31
Whole number of colored	528
Transient	88
Total number admitted, supported, and treated in hospital	1,119
Of the above patients there were discharged cured	585
Discharged relieved	80
Discharged, transient	83
Died	139
Still-born	4
Remaining in hospital June 30, 1880:	991
Males, white	29
Females, white	4
Males, colored	101
Females, colored	94
Total	195
Total	226

The Colored Orphans' Home and Asylum, containing about 115 children and attendants, has been furnished with medicines during the year. This institution was formerly a part of the hospital; but as it now receives a separate appropriation from Congress, this assistance is withheld.

Besides the above, a large dispensary has been supported for the bene-

fit of the numerous poor who are constantly applying to this hospital for aid. Of these, the names of 1,949 have been entered in the book for out-patients, and about 4,000 prescriptions have been made and put up for them.

The nativity of the patients admitted to hospital was as follows :

Virginia.....	264	New Jersey.....	3
District of Columbia.....	135	Switzerland.....	3
Maryland.....	127	Wales.....	3
Ireland.....	71	Turkey.....	2
New York.....	38	Illinois.....	2
Germany.....	30	New Hampshire.....	2
Pennsylvania.....	27	Nova Scotia.....	2
North Carolina.....	13	Tennessee.....	2
England.....	7	Vermont.....	2
Massachusetts.....	7	Africa.....	1
Kentucky.....	7	Austria.....	1
Scotland.....	5	Belgium.....	1
South Carolina.....	5	Florida.....	1
Georgia.....	6	Indiana.....	1
Canada.....	4	Michigan.....	1
Connecticut.....	4	Minnesota.....	1
Mississippi.....	4	Ohio.....	1
West Virginia.....	4	Peru.....	1
Alabama.....	3	Rhode Island.....	1
Delaware.....	3	West Indies.....	1
France.....	3	At sea.....	1
Holland.....	3	Unknown.....	13
Louisiana.....	3		

The diseases and conditions for which the patients were admitted to hospital and treated in dispensary were as follows :

Disease, &c.	Hospital.	Dispensary.	Disease, &c.	Hospital.	Dispensary.
Fracture of forearm.....	1	2	Tumors.....	2	5
Fracture of nose.....	1	.....	Tumors, keloid.....	.....	1
Fracture of lower jaw.....	1	.....	Tumors of eyelid.....	.....	3
Fracture of ribs.....	1	.....	Bursa.....	.....	1
Fracture of clavicle.....	2	1	Foreign body in ear.....	.....	1
Fracture of shoulder.....	2	.....	Foreign body in throat.....	.....	1
Fracture of patella.....	2	.....	Ozena.....	1	.....
Fracture of thigh.....	2	.....	Otitirrhoea.....	.....	5
Fracture of leg.....	1	.....	Syphilis.....	30	47
Dislocation of radius.....	.....	1	Syphilis, secondary.....	8	29
Inflammation of knee-joint.....	2	.....	Syphilis, tertiary.....	3	12
Synovitis.....	1	.....	Gonorrhœa.....	10	64
Inflammation of ankle-joint.....	1	.....	Orchitis.....	3	7
Gunshot wounds.....	7	2	Gravel.....	1	.....
Incised wounds.....	6	26	Incontinence of urine.....	.....	2
Lacerated wounds.....	1	.....	Retention of urine.....	1	4
Punctured wounds.....	.....	2	Nephritis.....	1	.....
Contused wounds.....	5	.....	Chronic cystitis.....	.....	3
Contusions.....	2	15	Hæmaturia.....	2	2
Sprains.....	2	14	Stricture of urethra.....	1	1
Caries.....	15	4	Fistula of urethra.....	1	.....
Osteo-sarcoma.....	1	1	Uraemia.....	1	.....
Poison.....	.....	4	Perineal abscess.....	1	.....
Chronic ulcer.....	13	28	Rheumatism.....	58	136
Varicose ulcer.....	1	.....	Lumbago.....	1	9
Varicose veins.....	1	.....	Sciatica.....	1	2
Abscess.....	7	4	Delirium tremens.....	18	.....
Snake-bite.....	1	.....	Alcoholism.....	14	.....
Chilblains.....	.....	4	Anaemia.....	.....	1

Disease, &c.	Dispensary.	Disease, &c.	Hospital.	Dispensary.
Inanition.....	2	Gastralgia.....	7	
Cataract.....	1 2	Gastritis.....	3	3
Blindness.....	3	Acute diarrhœa.....	14	94
Conjunctivitis.....	6 18	Chronic diarrhœa.....	11	8
Conjunctivitis, granular.....	3	Dysentery.....	5	21
Amaurosis.....	1	Enterocolitis.....	2	
Iritis.....	1	Chronic hepatitis.....	4	
Eczema.....	1 3	Jaundice.....	2	4
Erythema.....	1	Peritonitis.....	6	
Herpes.....	1 2	Hernia.....	6	6
Urticaria.....	1 7	Hernia, strangulated.....	1	
Ecthyma.....	1	Fecal impaction.....	1	
Acne.....	1 2	Prolapsus ani.....	1	
Scabies.....	2 2	Rectal sinus.....	1	
Varicella.....	1	Inflammation of spleen.....	1	
Lichen.....	2	Inflammation of rectum.....	1	
Psoriasis.....	1	Stricture of rectum.....	1	
Rupia.....	1	Hæmorrhoids.....	4	7
Tinea capitis.....	1	Fistula in ano.....		3
Carbuncle.....	1 2	Cardiac dropsy.....	4	
Whitlow.....	2	Renal dropsy.....	3	1
Cancer.....	5 3	Hepatic dropsy.....	2	
Intermittent fever, tertian.....	30 135	Ascites.....	2	1
Intermittent fever, quotidian.....	14 71	Albuminuria.....	8	3
Remittent fever.....	5 6	Hydrocele.....	1	
Typhoid fever.....	2 5	Aphasia.....	1	
Congestive chill.....	1	Hemicrania.....	3	
Erysipelas.....	3 2	Cephalalgia.....	2	24
Rubeola.....	4	Sunstroke.....	3	
Scarlatina.....	1	Insanity.....	6	
Catarrh.....	40	Insomnia.....	5	
Croup.....	4	Congestion of brain.....	1	
Acute bronchitis.....	20 132	Softening of brain.....	1	
Chronic bronchitis.....	5 17	Inflammation of brain.....	2	
Laryngitis.....	6	Epilepsy.....	6	9
Pneumonia.....	8 8	Convulsions.....	2	
Pleurisy.....	6 30	Paralysis.....	21	5
Typhoid-pneumonia.....	1	Neuralgia.....	6	23
Congestion of lungs.....	1	Concussion of spine.....	1	
Gangrene of lungs.....	1	Spinal irritation.....	1	
Asthma.....	4 7	Congestion of spinal cord.....	1	
Phthisis pulmonalis.....	79 48	Curvature of spine.....	1	
Hæmoptysis.....	7	Pregnancy.....	61	31
Scrofula.....	2 24	Suffering from parturition.....	5	
Pertussis.....	10	Abortion.....	4	1
Pleurodynia.....	4	Mammitis.....		1
Functioinal disease of heart.....	3	Amenorrhœa.....	1	18
Valvular disease of heart.....	2 3	Leucorrhœa.....		13
Hypertrophy of heart.....	2	Dysmenorrhœa.....	1	5
Angina pectoris.....	1	Menorrhagia.....		24
Aneurism.....	4 1	Cellulitis.....	1	3
Aneurism innominata.....	2	Ovaritis.....	1	3
Goitre.....	5	Metritis.....	1	
Mumps.....	4	Ehdometritis.....	2	
Odontalgia.....	104	Hypertrophy of uterus.....	3	
Teeth extracted.....	167	Congestion of uterus.....	1	
Aphthæ.....	4	Procidencia.....	1	5
Tonsillitis.....	2 54	Vaginitis.....		1
Stricture of œsophagus.....	1	Recto vaginal fistula.....	1	
Pharyngitis.....	1 1	Phlegmasia dolens.....		1
Dyspepsia.....	5 49	Change of life.....		2
Constipation.....	1 87	Hysteria.....	1	3
Colic.....	3 14	Puerperal convulsions.....		1

Disease, &c.		Dispensary.	Disease, &c.	Hospital.	Dispensary.
Born	60	.....	Dementia	4	1
Infancy	8	.....	Deformity	1	.....
Dentition .....	.....	2	Opium-eating	1	.....
Worms .....	.....	16	Malingering	2	.....
Senile debility	7	.....	Total	819	1,949
General debility	20	24			

The following table shows the number of cases of each disease which resulted fatally:

Disease.	White.	Colored.		Disease.	White.	Colored.	Total.
Phthisis Pulmonalis	6	45	51	Puerperal convulsions .....	.....	1	1
Senile debility	1	7	8	Puerperal peritonitis	1	.....	1
General paralysis .....	.....	7	7	Metritis .....	.....	1	1
Chronic diarrhoea	1	5	6	Inanition .....	.....	1	1
Diarrhoea .....	.....	3	3	Trismus nascentium .....	.....	1	1
Dysentery	1	2	3	Valvular disease of heart .....	.....	1	1
Chronic hepatitis	1	2	3	Hypertrophy of heart .....	.....	1	1
Chronic dysentery	1	.....	1	Rheumatism of heart .....	.....	1	1
Cancer of uterus	1	2	3	Congestion of lungs	2	1	3
Cancer of left antrum				Gangrene of lungs .....	.....	1	1
highmorianum .....	.....	1	1	Hemorrhage of femoral			
Typhoid fever .....	.....	3	3	artery .....	.....	1	1
General dropsy .....	.....	2	2	Aneurism of innominate			
Cardiac dropsy .....	.....	1	1	artery .....	.....	1	1
Hæmoptysis .....	.....	3	3	Tubercular suppura-			
Uræmia .....	.....	3	3	tion of brain and			
Albuminuria	1	1	2	spinal cord .....	.....	1	1
Pneumonia .....	.....	2	2	Congestion and in-			
Pleurisy .....	.....	1	1	flammation of brain .....	.....	1	1
Peritonitis .....	.....	3	3	Series of abscesses .....	.....	1	1
Convulsions .....	.....	2	2	Emphysema .....	.....	1	1
Softening of brain .....	.....	2	2	Congestive chill .....	.....	1	1
Congenital debility .....	.....	2	2	Meningitis .....	.....	1	1
General debility .....	.....	1	1	Tertiary syphilis .....	.....	1	1
Enteritis .....	.....	1	1	Overlaid	1	.....	1
Enterocolitis .....	.....	1	1				
Typhoid-pneumonia .....	.....	1	1	Total	17	122	139
Melæna .....	.....	1	1				

The following table shows the number of married and unmarried women who gave birth to children in hospital during the year:

	White.	Colored.	Total.
Married	1	8	9
Unmarried	3	46	49
	4	54	58

Besides numerous minor surgical operations, the following more important operations were performed:

Amputation of thigh.....	3	Excision of hypertrophied prepuce.....	1
Amputation of arm.....	3	Tapping through rectum.....	2
Amputation of breast.....	1	Reduction of dislocated elbow.....	2
Amputation of penis.....	1	Reduction of fractured femur.....	1
Excision of lower jaw.....	1	Tapping for hydrocele.....	4
Excision of bony tumor from neck.....	1	Tapping for abdominal dropsy.....	8
Excision of epulis of superior maxillary bone.....	1	Operation for removing caries bone.....	6
		Removal of cancerous scrotum.....	1

The severity of the cases admitted to hospital may be inferred from the fact that 17 died during the first four days after admission. A glance at the table of diseases which proved fatal will show that most of the deaths resulted from incurable diseases and conditions, such as consumption, senile debility, general paralysis, chronic diarrhoea, and dysentery.

It will be observed that in 49 of the 58 cases of confinement the mothers were not married; of these, 26 were first confinements and 16 were second confinements. There is very little chagrin or mortification on the part of these mothers, and yet they are far from being abandoned and dissolute women. There is no law in the District to reach them, nor are the partners of their guilt amenable to law—a circumstance very much to be deplored. It is recommended that the *readmission* for confinement of unmarried women be restricted. The name of the father of every illegitimate child born in hospitals is now made a matter of record.

Religious exercises and chaplain services have been performed by theological students, licentiate preachers, who receive their board for their services.

Many of the articles of clothing and bedding used in the hospital are manufactured on the premises, at a slight advance from the cost of the raw material.

The appropriation for the support of this hospital for the fiscal year ending June 30, 1880, was \$41,736.

The morning report shows that 85,563 days of support have been afforded to patients during the year. Without the rent, this makes the daily cost of each patient for subsistence, medicines, nursing, and clothing less than 45 cents.

It is believed that no governmental or eleemosynary institution in the District affords so good care and treatment for the amount of money expended as this hospital.

As evidence that the patients are well cared for here, I cite the fact that most of them, white and colored, when cured leave the hospital with reluctance, and most of those who have once been treated here, when again overtaken by accident or disease, apply a second, third, fourth, and even a fifth time for admission.

The necessity for the continuance of this hospital is manifest from the constantly increasing number of applications for the admission of persons suffering from accidents, from wounds, and from severe diseases. The number of admissions this year exceeds that of last year by 177, and that of the year before by 300.

Two hundred and eighty six persons were admitted during the year by recommendation of the police. In fact this is the only general hospital for the reception of all classes of patients within the District. Many of the patients are non-residents, and must be provided for somewhere by the general government when they fall sick in this city. The location of the hospital is central and healthy. Not a case of original malarial

disease has been known to occur within the premises since they have been occupied for their present purposes, and only one case of typhoid fever.

It will be perceived that the character of the hospital, so far as color is concerned, is changing; of 503 admissions to the male wards during the year, 250 were white and 253 were colored. Thus it is evident that this institution is supplying the need of a general hospital, which has been so long felt in this community.

Very respectfully, your obedient servant,

G. S. PALMER, M. D.,
Surgeon-in-Chief.

Hon. CARL SCHURZ,
Secretary of the Interior, Washington.

REPORT OF THE GOVERNOR OF UTAH.

UTAH TERRITORY, EXECUTIVE DEPARTMENT,
Salt Lake City, September 20, 1880.

I have the honor to submit the following report of the condition of this Territory, in compliance with your request:

PUBLIC LANDS.

The United States land office at this point makes the following showing for the fiscal year ending June 30, 1880:

Pre-emption filings, 302.
Pre-emption cash entries, 113; embracing 16,392 acres.
Homestead entries, 508; embracing 78,601 acres.
Homestead proofs, 161; embracing 20,021 acres.
Desert entries, 69; embracing 12,654 acres.
Desert proofs, 38; embracing 5,089 acres.
Timber-culture entries, 36; embracing 4,043 acres.
Coal entries, 2; embracing 791 acres.
Mineral applications, 156.
Mineral entries, 101.
Adverse mining claims, 116.

This table shows an increase in the following class of entries over the preceding year:

Homesteads, 6,600 acres.
Final homesteads, 7,300 acres.
Desert entries (proofs), 4,770 acres.
Timber-culture entries, 1,700 acres.
Mineral applications, 83 in number.
Mineral entries, 24 in number.

There has been a decrease in the following class of entries, viz:

Pre-emption filings, 320 in number.
In cash entries, 2,100 acres.
Desert entries, 175 acres.

Adverse mining claims, 41 in number.

The agricultural claims initiated as against the former year show a falling off of 30%, although the acreage is slightly increased, while the proofs thereunder show an increase of 15. In other words, the agricultural settlements made in the past year were 915 against 1,224, and the proofs 312 against 297 in the preceding year.

The falling off in the initiation of agricultural claims proves that a large per cent. of the farming lands which are surveyed in the Territory are taken up under the several acts granting rights to settlers.

The most prominent feature of this table is the increase of mineral applications and mineral entries, the former more than doubling the number of any previous year, and the latter increasing about 24 per cent. over the preceding year. Notwithstanding this remarkable increase of mineral applications there has been a corresponding decrease in the number of adverse mining claims filed, which fact speaks well for the mining industry of this Territory.

CATTLE AND SHEEP.

From the most reliable information that it is possible to obtain, I estimate the number of cattle in the Territory to be 200,000 head. There were driven from the Territory during the year past certainly not less than 50,000 head, at an average price of \$15.50 per head.

The number of sheep in this Territory will not fall short of 500,000, with a yield of wool of, say, 2,000,000 pounds, for which our raisers have received 20 cents per pound.

The winter ranges for the most part are rapidly filling with population, which, of course, crowds the stock men off of them. The excess of summer over winter ranges is in the ratio of 3 to 1 at present. The fact that the winter ranges have been overstocked, rendering them worthless for the present, is another reason for the difference between them and the summer ranges.

Without legislation by Congress that will allow stock-raisers to obtain rights other than those given by common consent, this very important branch of industry must continue to retire before the demands of increasing population.

AGRICULTURE.

Notwithstanding the dearth of water during the summer of 1879, which in some localities left very short crops, the yield of wheat, oats, and barley proved to be an average one. The potato crop, as a rule so extensive and superior, proved a very short one, but the crop for 1880 will be abundant. The summer of '79, with very little rain-fall and an exceptional scarcity of water from the mountain snows, was followed by a severe and prolonged winter, proving deleterious to the crops of 1880. Corn, which is by no means a reliable growth, on account of the exceptionally late spring, was given a very small acreage by our farmers. Lucerne to a great degree has taken the place of corn; being to a degree independent as to length of season and quantity of water, its thrifty growth and immense yields commend its cultivation. Lands that yield only ten bushels of wheat to the acre will readily yield eight tons per acre of lucerne. Three harvests, and oftentimes four, are gathered during the season, after it has become well set; in fact, in the southern part of the Territory five cuttings are made, yielding ten tons to the acre.

DRY FARMING.

The large tracts of land unoccupied by reason of the cost in having irrigating canals reach them, and oftentimes an impossibility to obtain sufficient water by irrigation at any cost, joined with an increasing population seeking homes, has caused dry farming to be greatly increased. Upon such farms last year from ten to twenty bushels per acre of wheat was raised. Many engaged in this apparently hopeless task continue their work from year to year, and are tenacious in their purpose to increase the acreage.

WATER.

Throughout the Territory irrigating canals are yearly increased and improved upon. Much land heretofore untilled is constituted thereby into farm homes. It is observable also that a greater acreage is from year to year cultivated with the same amount of water. This is secured by an economical distribution in the fields through which the streams or canals pass. When the water of twelve months that flows down the cañons is garnered in reservoirs, and these are supplemented by artesian wells with which to supply the crops in growing season, the now sage lands in the valleys of Utah will more than double their present product.

POPULATION.

The population of Utah is far beyond that of any Territory in the history of the United States. In 1870 the population was 86,786. In 1880 it is shown to be 145,000, an increase of over 58,000 souls. The mines of the Territory, with their attendant business, have drawn, I may safely say, of this 58,000 increase, fifty per cent. The other fifty per cent. is natural increase, and the result of the labors of the missionaries sent out into all the world by "The Church of Jesus Christ of Latter Day Saints," which, besides increasing the population of Utah, is contributing largely to the population of the surrounding States and Territories.

MINES.

I know of no fact why it may not reasonably be claimed that Utah will prove the richest repository of silver, gold, coal, and lead, and other minerals, of all the States and Territories of the West. Certainly no four hundred miles of mountain ranges have produced as many mines of immense yields, and so many mining prospects, as the suggestions of science and practical observation make those of Utah appear. The practice of capitalizing mining prospects at fabulous sums is to be condemned. Responsible mining men are reducing mining enterprises to a practical business basis. This will, as it should, tend to renewed confidence, and increased capital applied in a legitimate way to the development of ore bodies, instead of gambling in "wild cat" mining stocks, so unwarrantably and disastrously indulged in in the past.

Many mining districts heretofore inaccessible are now in close connection by railroads with the markets. Much of the ore, on account of its low grade, has not heretofore paid to mine; but which now, on account of superior methods in extracting and reducing the ore, is made profitable. As a rule, the men who own the best prospects are not able to develop them for lack of means. Capital is needed, and with anything like reasonable business judgment can be made to realize most gratifying results.

From Col. O. J. Hollister and Mr. J. E. Dooley I have obtained the following statement of the mining products of Utah, which, I feel assured, is a very correct record, viz: \$21,000,000 in value is the estimate of the Territory's output down to the end of 1875, usually received, based on records kept by Professor Barfoot, of the Salt Lake Museum. Fortunately the output of 1876-7-8-9 has been accurately figured and stated at the close of each of those years, by J. E. Dooley, agent of Wells, Fargo & Co., at Salt Lake City, and is of record.

It was for 1876:

Lead, 50,401,893 pounds, at 6 cents.....	\$3,024, 113 00
Copper, 657,539 pounds, at 20 cents.....	131, 507 00
Silver, 1,946,915 ounces, at \$1.10.....	2, 141, 606 00
Gold, 8,820 ounces, at \$20.69.....	182, 309 00
Total.....	5, 479, 535. 00

It was for 1877:

Lead, 54,936,080 pounds, at 3 cents	\$1, 648, 082 00
Silver, 4,359,703 ounces, at \$1.20	5, 231, 643 60
Gold, 17,325 ounces, at \$20.60	356, 895 00
Total	7, 236, 620 60

It was for 1878:

Lead, 40,414,359 pounds, at 1½ cents	\$707, 251 25
Refined lead, 2,620,422 pounds, at 4 cents	104, 816 80
Copper matte, 1,259,100 pounds, estimated value.....	22, 034 25
Copper pigs, 19,737 pounds, estimated value	2, 066 83
Silver, 4,357,328 ounces, at \$1.13.....	4, 923, 780 64
Gold, 15,040 ounces, at \$20	300, 800 00
Total	6, 060, 749 25

It was for 1879:

Lead, 26,441,359 pounds, at 2½ cents	\$594, 930 00
Refined lead, 2,301,267 pounds, at 4½ cents.....	103, 557 00
Silver, 3,835,047 ounces, at \$1.10	4, 218, 551 00
Gold, 15,932 ounces, at \$20.67	329, 314 00
Total	5, 246, 352 00

Summary.

Prior to 1876	\$21, 000, 000 00
1876	5, 479, 535 00
1877	7, 237, 832 00
1878	6, 071, 125 00
1879	5, 246, 352 00
Total	45, 034, 844 00

The average output for the last four calendar years was a little more than \$6,000,000 yearly.

The product for the calendar year 1879 as given above is its *export value in Salt Lake City*. Computing the precious metals after the style of California and Nevada, viz, at their mint valuation, and the lead at its value in New York City, it would increase the value to \$6,663,676.10, as follows:

Deducting five per cent. for actual loss in refining lead, 27,520,568 pounds, at 5 cents, average New York price	\$1, 376, 028 00
3,835,047 ounces silver, at \$1.2929, mint valuation	4, 958, 333 26
15,932 ounces gold, at \$20.67, mint valuation	329, 314 44
Total for 1879	6, 663, 676 10

And other years proportionately.

RAILROADS.

I give the different roads, their gauge, weight of rails, and miles, and the number of miles opened during the last year, all of which speaks well for the business of the Territory, viz :

Gauge.	Name.	Miles.	Weight of rails. <i>Pounds.</i>
4 feet 8½ inches...	Central Pacific Railroad.....	154	56
4 feet 8½ inches...	Union Pacific Railroad.....	71	56
3 feet.....	Utah and Northern Railroad.....	77	30
4 feet 8½ inches...	Utah Central Railroad, Ogden to Salt Lake City, opened January, 1870.....	38½	56
4 feet 8½ inches...	Utah Southern Railroad, Salt Lake City to Juab, Juab County, opened to Sandy, September, 1871, to Juab, June, 1879.....	105	56
4 feet 8½ inches...	Utah Southern Railroad extension, Juab to Frisco, opened to Milford, May, 1880, to Frisco, July, 1880.....	137	56
3 feet.....	Utah Western Railroad, Salt Lake City to Stockton, Utah Territory, opened January, 1875.....	40	30
3 feet.....	Wasatch and Jordan Valley and Bingham Cañon Railroads, opened from Sandy to Granite, 1872, to Alta, 1876.....	44	30
3 feet.....	Utah and Pleasant Valley Railroad, Provo to Pleasant Valley, opened October, 1879.....	60	30
4 feet 8½ inches...	Summit County Railroad, constructed by the Union Pacific Railroad, to run from Echo to Park City, fourteen miles complete, about sixteen miles to build, will be finished by November 1.....	35	56
3 feet.....	Utah Eastern Railroad, Coalville to Park City, twenty-three miles graded, and to be completed November 1, 1880, to be continued to Salt Lake City.....	23	30

A working survey is now being made by the Union Pacific engineers to demonstrate the practicability of a line from Brigham City, Utah, to Portland, Oreg. This line, if built, besides opening up a vast territory, will greatly shorten the line from the east to Yokohama, Japan.

INDIANS.

At the Uintah Reservation, in the northeast part of the Territory, there are about four hundred and fifty Indians who receive government supplies. In addition to these there is a small band living in Thistle Valley cultivating farms, and having in several instances disavowed their tribal relations. At the Uintah Agency there are 115 families, and of these some eighty-five are engaged in farming operations, and others, with a few exceptions, in stock-raising. Two hundred and fifty acres, however, is the aggregate, for this year, of land cultivated by them. This is less than in previous years, owing to a scarcity of seed, wheat having been used for subsistence last winter. Colonel Critchlow, in charge of that agency for a number of years, in his report of the year last past speaks at length of their conduct during the White River troubles, highly commending them. Although intimately related and always friendly with the White River Utes, they expressed no sympathy for them in hostility, and he now says of them that they express their gratification at the prospect of an amicable settlement of these difficulties. The Presbyterian Board of Missions has entered into a contract with the government and propose, at an early day, establishing a school for Indian children at this agency. Colonel Critchlow anticipates much benefit in future years, both to children and adults, from the educating and Christianizing influences of this school and mission.

In the vicinity of Plainfield, situated on the eastern border of the Territory, south of the Uintah Agency and near the La Sal Mountains, the inhabitants have felt much uneasiness on account of the bearing and

trespasses of a number of Indians that frequent that section. The settlers are at their mercy, and with this point protected I can say the condition of Indian affairs in Utah is satisfactory, in so far as it is possible for me to know.

SOCIAL CONDITION.

The Territory of Utah stretches from the 37th to the 42d degree of latitude. With the exception of Utah there is now a solid line of States from the Atlantic to the Pacific Oceans. Between the same latitude and between the oceans lie twenty of the thirty-eight States of the Union. With the great roadways of the continent running through and joining within her borders; with the climate of this parallel, made lovely by altitude and softened by its location in the great basin between the Rocky Mountains and the Sierra Nevada, including in its population a large number of thrifty industrious, law-abiding and law-loving people; with all this there remains a reason why Utah should be denied statehood, possessing, as she does, requisites which, otherwise, would entitle her to be a State. The United States should give to Utah a good government; as it is she possesses "the shadow, but not the substance of government." There has not been that thrifty growth her valleys, mines, and situation entitle her to. As it is, Utah can never be American and in accord with a people whose highest allegiance is to the flag of the United States. And as long as Utah is allowed to remain with her present practices, organization and laws, it cannot be said that this government deals out equal and exact justice to all its citizens. It cannot be claimed that the United States sees to it that her laws are fairly and surely executed. If not the chief corner-stone, at least a continuing practice of "The Church of Jesus Christ of Latter Day Saints" is polygamy, defended by its members, practiced by them, and solemnized with secret rites, without civil or church record, and by regularly appointed officers of the church. The church dictates, suggests, or its influences control all things spiritual or secular among its people. The officers of the church, and those in polygamy, to a great extent fill the offices in the Territory, enact its laws and execute them. Congress passed, in 1862, a law forbidding polygamy, and prescribed penalties. This law, I am sure, is approved by the entire law-abiding and well-thinking people of the United States from Maine to Texas. It has been adjudged by the Supreme Court to be constitutional, and yet the government for years has permitted the law to be ruthlessly thrust aside and others to be enacted that practically obstruct the statute, so as to make it impossible to convict under it, and allow the Territory to be governed in such a way as to put a premium on crime, and further permit the guilty ones to be sent to the legislature and to Congress, and paid for their record and services out of the Treasury of the United States.

Why should the Government of the United States allow one of its citizens to be sentenced to the penitentiary, say in New York, for violating a law of Congress and allow another here to go unwhipped in wilfully violating a law similarly passed and be promoted to office as a premium for his crime? Congress should wipe out its statute against polygamy, remove every officer who is sworn to see its laws executed, furnish free transportation to a quarter section of free land to each of the thousands of non-Mormons who with their stout hearts and strong muscles have made homes in this part of their country, repeal all laws objectionable to the dominant church here, so that the Territory may be run under ecclesiastical suggestion, pass a law constituting this an independent

polygamous State, a thing apart from the "wicked people" of the United States; or it should at once make it possible to execute the laws already passed. One or the other. Sheer justice to the thousands of children yet to be born with illegitimacy as their birth-mark under this illegal and indecent system, mercy to the first and only wife, when lustful or religiously fanatical husbands thrust them aside for new and fresher companions, respect for its own laws, equal and exact justice to all,—these and more make plaintive demands of Congress for speedy and sure adjustment of the wrongs; the termination of contentions that curse this goodly land and must continue to do so until proper legislation brings relief.

Time will not prove the remedy. It is revelation (so-called) against statute law. If the United States proposes that Utah and several other of its Territories—soon to be overspread by emigration—is to be governed by revelation, well and good. If, however, it proposes in the future as in the past to govern by laws of Congress applicable for all the people, then it is all wrong. It is the right against the wrong. If Congress is right, if the Supreme Court is right, if the President is right, if the people of the United States are right on this question, then this idea here persisted in is wrong, as it tends, it has been claimed, and does practically unite church and state, enslaves this people, constitutes them law-breakers, and the whole un-American.

RECOMMENDATION.

In so far as practical take the old statute of 1787, enacted by the fathers of our country, and under which the Territory of the great Northwest was formed, and under which so many States passed through their Territorial condition, and, in so far as practicable, later enactments, by which the District of Columbia is governed, and from that basis frame a statute for the government of Utah. Constitute a commission composed of the governor, the judges, and, say, three or five citizens of the Territory, they to be appointed by the President and confirmed by the Senate, and by this means establish a government here that will be in unison with American civilization, and will prove a government not only "for the people but by the people." *I again say time will not prove the remedy.* I earnestly hope for a peaceful solution of the problem here. Every effort with that end in view shall be, as it has been, mine. The Government of the United States, and those charged with the execution of its laws cannot, as they ought not, be dishonest in dealing with this question and the people here. A code of impartial, just, and uniform laws, with the means to administer it, and a fair and merciful execution of the laws is the peaceable solution.

There are other, and possibly more grievous wrongs, inflicted through legislation within the Territory of which I cannot well go into in a report of this nature, but which the plan suggested will remedy.

Further legislation is essential. I trust Congress will not delay consideration of this very important matter, and I respectfully suggest this action.

I have the honor to be, Mr. Secretary, most respectfully,

ELI H. MURRAY,

Governor.

The Hon. SECRETARY OF THE INTERIOR.

REPORT OF GOVERNOR OF WYOMING TERRITORY.

CONTENTS.

Evidences of general progress—The grazing interest—The cattle business—Sheep husbandry—Agriculture—The mining industry—The manufacturing industry—The timber interest—The preservation of game and the culture of fish—Recent public improvements—The survey of lands—Education—Law and order—The red man—Recent Territorial legislation of importance—The biennial election of county as well as Territorial officers—Concerning the keeping of Territorial convicts—Congressional legislation especially needed by the Territories—In aid of river improvements for protection of water privileges—Concerning jurisdiction of the Territorial courts—A procedure for Territorial courts when exercising the jurisdiction of circuit and district courts of the United States—Different constitution of Territorial supreme courts—Careful revision of all laws of the United States relating to the Territories—Insufficiency of recent appropriations.

REPORT.

EXECUTIVE DEPARTMENT, WYOMING TERRITORY,
Cheyenne, November 20, 1880.

SIR: In compliance with your request of August 16, for a report of the progress of this Territory since the date of my quite full account of its resources and condition submitted in 1878, I have the honor to present the following:

EVIDENCES OF GENERAL PROGRESS.

While the increase of population throughout the Territory has not been great since 1878, the settlement of some sections, more especially that portion lying east and north of the Big Horn Mountains, and embraced within the limits of the unorganized county of Johnson, has been quite rapid, so that but a short time can elapse before it will be necessary to proceed with the formation of a local government.

Growth has also been made in other remote sections, as well as along the line of Union Pacific Railway, where, especially in the larger towns and villages, the buildings erected and the general improvements made have been of that substantial character which indicates enterprise on the part of the people and a growing confidence in the future of the Territory.

THE GRAZING INTEREST

is still foremost, as it is likely to be for some years to come, and has made steady advancement. The former herds have, in many cases, very

considerably added to their natural increase by importations from the States and Territories farther west, and a considerable number of herds entirely new have been introduced, not only in sections hitherto partially occupied, but also in larger regions, as, for example, in the Powder and Tongue River sections, until very recently wholly unoccupied except by herds of buffalo.

The number of cattle now in Wyoming can be hardly less than 540,000 head; and the indications are that this will be largely increased during the next season, now that the superior advantages of this Territory for conducting a successful cattle business are coming to be better understood in all parts of the world.

It is also worthy of note that our cattle are quite rapidly improving in quality. There are fewer importations of young stock than formerly from Texas, and a correspondingly large number from the West, where considerable attention is now given to the improvement of the native stock by the infusion of better blood. Besides this, our stockmen are improving the better herds brought from the regions named, by the direct importation of males of the best known breeds from the East.

Owing to the increased cost of cattle purchased West—caused by the growing demand—and the rather low price of beef in the Eastern markets, the profits of the cattle business have naturally diminished somewhat during the last two or three years; but they are still sufficient to entitle it to rank foremost among the legitimate and entirely safe industries of the country.

Sheep husbandry has likewise made steady progress since the date of my last report. Fluctuation in the price of wool has been a disturbing element, but seems not to have put any serious check upon the business, or materially weakened the confidence of those engaged in it. The last severe winter taught some of them the lesson of better provision for their flocks; but I hear of none who have been disheartened by losses.

The number of sheep at present in the Territory is probably not less than 375,000 head, being an increase of 175,000 head since 1878.

AGRICULTURE.

Notwithstanding the large areas so well suited to the production of the cereal, root, and grass crops, the agricultural industry advances but very slowly. This is partly due to the assumed superior profitableness of the stock business, and in part because of a lack of confidence in the possibility of a successful agriculture at so great an altitude as from 5,000 to 7,000 feet above the sea-level. And yet it is a fact that, wherever a fair trial has been made, wheat, rye, barley, oats, clover, timothy, potatoes, and other root crops, with garden vegetables of every sort, and some of the small and hardy fruits, have succeeded very remarkably, being excellent in quality and astonishing in yield. East and north of the Big Horn Mountains, as well as in other portions of the Territory, fine crops have, in some instances, been produced without irrigation. This can only happen in the more favorable seasons; but, with a proper supply of water, there are millions of acres in our many rich valleys that can be cultivated with a certainty of large yields; and, it may be added, with an equal certainty of liberal profits. For the most part, the lands are easily broken and cultivated; while an abundance of water, easily and cheaply rendered available, makes the husbandman sure of his reward.

With wheat at \$1.20 per bushel, oats at \$1.90 per hundred pounds, wild hay at \$18 to \$20 per ton, tame hay at \$24 per ton, potatoes at 24

cents per pound, with all sorts of vegetables at corresponding prices, and with the small fruits producible here bearing prices yet higher in proportion, it is easy to see that the cultivation of the soil may be made a profitable business in Wyoming, more especially as lands of the best quality may be had under the pre-emption, desert, and homestead acts at merely nominal rates, and as the tilling of the soil can be carried on so conveniently in connection with the stock business.

I trust that the day is not far in the future when agriculture will have become an important element of our wealth and prosperity.

THE MINING INDUSTRY,

Although for a time somewhat checked in its development by discoveries in the Black Hills, and the yet more remarkable developments at Leadville and other points in the neighboring State of Colorado, and the consequent exodus of some of our prospectors and miners, again shows encouraging signs of a growing activity. New discoveries of gold have been made in the Medicine Bow Mountains, on Douglass Creek, in Carbon County, as well as in Jelm Mountain, in Albany County, in both of which districts mills have been recently planted. Discoveries of silver in Uinta County have also been reported, and are attracting attention. Scientific observers and practical miners are alike firm in the conviction that when prospectors shall have turned their attention to Wyoming with anything like the zeal which has characterized their labors elsewhere, our mountains will be found as productive of the precious metals as any of those sections at present enjoying so remarkable a development.

It was this general conviction that prompted the legislature in 1879 to make provision for a Territorial geologist and mining engineer, to be charged with the duty of making scientific explorations with a view to new discoveries, and of assisting with his advice as an expert, when solicited, in the economical improvement of mines already opened.

As was set forth in my first report, we have not only inexhaustible supplies of coal, of excellent quality, and of which some three hundred thousand tons are annually mined and marketed, but likewise immense supplies of iron, graphite, petroleum, soda, and sulphur, with good indications at various points of very extensive bodies of copper ore. It is true that, with the exception of petroleum, which proves to be a superior lubricating oil, and is now in use by the Union Pacific Railway Company, those valuable resources are still lying untouched, capitalists being ignorant of them or claiming that, owing to bulk and cheapness of product, they cannot be profitably utilized until there can be had lower rates of transportation than those at present offered.

Encouraging responses to my appeals in this behalf have been made by the Union Pacific Company, however, with the assurance that as cases arise they will be dealt with in a most liberal spirit. I am not without hope, therefore, that eastern capital will soon be enlisted in the development of these vast resources.

THE MANUFACTURING INDUSTRY,

though slow in its development, for the reason that it waits on mining and cheap transportation, is nevertheless, advancing in some of its departments. A number of flouring and saw mills have been built within the past two years, and talk is heard of yet other kindred enterprises. Still, it must be said that many very advantageous fields in the domain

of manufactures which could be cultivated with profit remain wholly unoccupied. Besides the working up of our soda, graphite, and sulphur, the packing and canning of beef, the cording and spinning of wool, the manufacture of woolen cloths and of clothing therefrom, there are numerous other branches of the manufacturing industry that could be built at once with profit to the capitalist as well as general advantage to the Territory.

THE TIMBER INTEREST.

On the use and protection of our forests I may be permitted to quote from my message to the sixth legislative assembly as follows :

Some provisions of the timber laws of the United States are at present an embarrassment to our people, and a great hinderance to the improvement of the Territory. It is unquestionably very important that great care should be exercised by the general government in the protection of forests on the public domain. So much is clearly demanded by the interests of the future. At the same time, whatever can be done, without hazard to those interests, to help the pioneer, struggling to establish himself in a new section of the country and to build up therein great and prosperous communities should be done. In my judgment, formed after a very careful and protracted consideration of this whole subject, the laws and regulations of the United States relating to timber and timber lands in this mountain region should be so modified as—

1. To insure to settlers, wherever their numbers are sufficient to warrant the survey, the opportunity to purchase timber lands in small tracts, and at fair prices, graded and classified within fixed maxima and minima, according to relative value.

2. To allow, in districts where surveys have not been made and lands cannot be so purchased, the cutting of necessary timber, at moderate rates for stumpage and under proper regulations, for other than the personal use of those cutting it—that is for the purchase and use within the territory of any resident thereof, or of any person or corporation non-resident, yet engaged in making improvements therein.

3. To prohibit, under any circumstances or conditions, the cutting or removing, or the causing to be cut or removed, from the public lands of this region, any green timber whatever size, where sound, dead timber, falling or standing, and suitable for the purpose can be had.

4. To grant the freest possible use of any fallen timber, wherever found.

5. To afford yet greater security against forest fires by enactment of more stringent laws, with severe penalties against carelessness in the kindling of fires and against the neglect to extinguish fires already kindled, which have served their lawful purpose. For, while much destruction of timber on the public lands has resulted from the cupidity and reckless waste of persons using and speculating in the products of our forests, all these depredations combined have been as nothing compared with the waste by fires.

THE PRESERVATION OF GAME AND THE CULTURE OF FISH

have been promoted by recent legislation; the first by more stringent laws relating to the unnecessary destruction of our game of every kind, the latter by the creation of a Fish Commission and the appropriation of quite a liberal sum of money to be used in stocking the streams of the Territory with trout and other desirable species of fish. Under the law last above referred to, a competent and zealous commissioner has introduced large numbers of young trout into the headwaters of the Platte and other streams apparently well suited to this most excellent of all the fishes found natively in this region, but hitherto without it. This enterprise is so far successful and bids fair to result in the addition of several beautiful rivers to the already large list of the trout streams of Wyoming. Black bass have also been introduced into some of our lakes.

THE MORE IMPORTANT PUBLIC IMPROVEMENTS

recently made consist of—

1. A new wagon road from Rawlins to the Rapo-Agie Valley as a means of more direct communication with Fort Washakie and the Indian Reservation ;

2. The construction of a line of telegraph between Camp Stambaugh and Fort Washakie, thus connecting that important post with the outside world ;

3. The betterment of the stage road from Fort Fetterman to Fort Custer via Fort McKinney and the Goose Creek settlements ;

4. The opening of a new and shorter wagon road from the base of the mountains, in the valley of the Little Laramie to the Douglass Creek mines ;

5. The opening of a road from Cheyenne to the mining camps in North Park, and

6. Telegraph extension from Fort Fetterman to Fort McKenney.

The matter of railway communication between Cheyenne and Montana, with a branch to the Black Hills, has advanced so far as to gain recognition from the Territorial legislature and the Union Pacific Railway Company. A law was passed at the last session authorizing Laramie County to issue bonds to the amount of four hundred thousand dollars to the Wyoming, Montana & Pacific Railroad Company when the said company shall have completed and equipped one hundred miles of road from the city of Cheyenne, and shall also have erected at said city machine shops for the use of said company at a cost of not less than twenty-five thousand dollars. And, during the past season, engineers have been at work selecting the most feasible routes.

Such a road passing near the vast iron deposits of the Laramie Range, some twenty-five or thirty miles northward of Cheyenne, touching also the military posts of Laramie, Fetterman, and McKinney, thence traversing the fertile and rapidly improving region east and north of the Big Horn Mountains, and skirting the northern boundary of the National Park, would certainly confer large benefits upon this Territory and that of Montana. It is hoped that its construction will not be long deferred.

A railway from Laramie City, through North Park, Middle Park, to important mineral districts in the mountains of Colorado has also been projected, and a company has been organized for the purpose of setting the enterprise on foot.

The North Park being inaccessible from the settled portions of Colorado, to which the greater part of it belongs, and yet freely opening into Wyoming, at a distance of only some fifty miles from the Union Pacific Railway, is naturally tributary to this Territory. And, inasmuch as the park, besides being a fine summer range for stock and abounding in coal and (it is said) copper is found to contain silver in amounts to justify very considerable expectations ; and since, moreover, the face of the country, over which the proposed railway would naturally be built, is such as to render it quite easy of construction, this new enterprise may be considered altogether practicable.

The growing interest in the wonders of the National Park warrants this repeated reference to the need of a direct wagon-road into it from Fort Washakie, from which it is distant scarcely more than one hundred and fifty miles. Such a road would pass through an interesting region of country, with attractions sufficient to reward the journey ; and since it could be constructed with the help of idle troops in a single season and at very trifling cost, it seems not unreasonable to hope that this suggestion will find favor with the Federal authorities. At present access is practically confined to very roundabout and expensive routes through Idaho and Montana.

THE SURVEY OF LANDS

still lags behind the public demand. So great is the embarrassment experienced on this account that during the past season, settlers have

repeatedly appealed to me for intervention in their behalf. It is hoped that Congress will very materially increase the appropriations for surveys so that the assignments to this Territory may prove more adequate to the reasonable demands of our people.

EDUCATION

continues to receive the fostering care of government and people. Although not numerous, the schools of the Territory are excellent in character, and well attended; attendance in the larger towns being 90 per cent. of all the children of school age. The last report of the superintendent of public instruction shows an aggregate of 36 schools, and of 49 teachers (29 male and 20 female), with the sum of \$22,121.45 paid as teachers' salaries. Owing to non-survey of the public lands, our education derives almost no help from this source, so productive in the more favored regions of the country.

LAW AND ORDER

now prevail as never before since the organization of the Territory. The vigorous co-operation of Federal and Territorial authorities with the counties and with interested corporations—especially the Union Pacific Railway Company and the Cheyenne and Black Hills Stage Company—resulted in breaking the bands of "road agents" by which we were so seriously afflicted in 1878, so that during the past season there has been almost entire immunity from their attacks.

THE RED MAN

no longer menaces Wyoming. With the exception of the 1,000 Arapahoes and the 1,300 Shoshones, all peaceably dwelling on their beautiful reservation in the Wind River country, and earnestly seeking the help of civilizing agencies, there is not an Indian within our borders. The settler locates in the wildest sections without fear of molestation, and the lone explorer wanders over our vast domain with a most comfortable and gratifying sense of security.

That this happy condition of things may continue indefinitely, it is urged that the government deal not only justly, but even generously, with the two remnants of tribes referred to. They are headed by chiefs remarkable for their friendly disposition, as well as for ability and influence, and a wise persistence of the Indian Bureau in its present policy towards them will insure their steady advancement. If yet more were done than is now doing for their enlightenment, and for their encouragement in gradually taking up suitable industries, their future would be yet brighter. There is special need of a good industrial school for each tribe, and it would also be well if the higher and more complete education of a few of the more promising youth, at institutions of learning in the States, could be provided for.

IMPORTANT TERRITORIAL LEGISLATION.

Among the many important acts with which the sixth legislative assembly (legislation of 1879) is to be credited, and which have not been mentioned already, I refer with satisfaction to the law which provides that hereafter members of the council and house of representatives, Delegate in Congress, sheriffs, county clerks, probate judges,

county treasurers, county and prosecuting attorneys, county commissioners, county superintendents of schools, coroners, surveyors, assessors, justices of the peace, and constables, shall be chosen *every two years*. Heretofore these officers, excepting members of the legislature and the Delegate in Congress, have been elected annually. This concurrence of elections, with diminished frequency, besides saving much unnecessary expense, will also serve to abate, in some degree, those evils which, under great frequency of elections, come of a perpetual ferment of political excitement and of undue rotation in office.

It is also worthy of note in this connection that a law was passed at the last session requiring that "the legislature of Wyoming shall convene at the capital of the Territory on the second Tuesday of January, in the year eighteen hundred and eighty two, and on the second Tuesday of January every second year thereafter." Hitherto the sessions have been held in November.

CONCERNING THE IMPRISONMENT OF CONVICTS.

There has been much controversy during the recent years on account of the disposition made of persons convicted of crimes against the laws of the Territory. Formerly they were kept at the United States penitentiary near Laramie City. But as the number of convicts increased, the burden of their support, at the price demanded by the Department of Justice, namely, \$1 per day, was felt to be so great that negotiations were authorized with prison managers outside of the Territory, resulting at last in an agreement with the authorities of the Nebraska State prison for the keeping of our Territorial convicts at 40 cents a day, cost of transportation included.

The validity of the law under which this was done having been questioned on certain grounds, and finally on these and other grounds denied by one of the United States district judges, amendments were made thereto by the legislature of 1879, with the view of remedying its defects. But the validity of the new law was also questioned and finally denied by a majority of the Supreme Court, on the grounds—

1. That the organic act does not authorize the sentencing of prisoners to confinement outside the Territory.
2. That Congress has provided a prison within the Territory.
3. That courts of the Territory cannot exercise jurisdiction beyond its boundaries, and that writs of such courts can have no validity within the limits of any other Territory or State.

Whereupon a law was passed by Congress for the purpose of legalizing what had already been done by the Territorial authorities, and providing for the future incarceration of prisoners of the Territory outside of its limits, at the discretion of the penitentiary commissioners, charged with making the requisite provision for the safe and economical keeping of convicts.

CONGRESSIONAL LEGISLATION ESPECIALLY NEEDED BY THE TERRITORIES.

So far as the keeping of prisoners is concerned it is desirable in the interest of mere economy that they be kept, as at present, in the penitentiary at Lincoln, Nebraska, or at some other prison outside the Territory, so long as the difference in cost of keeping them there and at Laramie is so great as now. But nearly every other consideration lies on the side of their being kept in our own penitentiary. And inasmuch

as the present United States marshal of the Territory is ready to enter into an agreement for keeping the Territorial convicts, at a price but little above the amount paid to the Nebraska penitentiary, with assurances of yet greater reduction as fast as possible, the only stipulation being as to number of convicts intrusted to his care, there seems to be but little in the way of accepting his terms other than the insufficiency of accommodations at Laramie, and the yet greater lack of the means of employing convicts in profitable industries.

In view of all the facts, it is in my judgment quite important that the Government of the United States, both on its own account and on that of the Territory, furnish the means necessary to the early fulfilment of these conditions.

The sixth legislative assembly memorialized Congress "for suitable legislation in reference to the public lands in Wyoming, so as to enable the several water-courses to be made available for agriculture." As was therein forcibly urged, there is nothing in existing laws to prevent a monopoly of water-privileges by comparatively few owners of large herds of cattle and sheep, to the practical exclusion of the agriculturist. This is a matter of great importance, not so much in the actual present as in the early future. As set forth under another head, the agricultural capabilities of Wyoming are far greater than is generally supposed, even by our own people. An interest so great as this should have immediate and full recognition. And yet it is manifest that if stock men are permitted to acquire absolute control of the valley lands, not with a view to their cultivation, but rather as a means of preventing it, and of controlling the largest possible area of contiguous grazing lands, to the exclusion of others who would occupy them, agricultural development will be impossible. In discussing this subject the memorial referred to says:

Your memorialists further represent that the laws of the United States in relation to the disposition of the public lands are wholly unsuited to the requirements of a country such as this, and need such reasonable modification and amendment as will adapt them to the circumstances which are peculiar to our location and situation.

The arid character of the soil and climate in this region of country renders it indispensably necessary that all occupants of the public lands should have a legal right of free access to the water-courses of the country.

The uplands and "divides" situate at a distance from the streams are covered with a luxuriant growth of nutritious grasses, but are comparatively worthless for any of the purposes of use and occupation unless the occupants can obtain some legal right to pass over adjacent lands to water.

The lands along the streams are being rapidly occupied and inclosed under present laws, whereby all access thereto is prevented. All this results in giving to those who have been so fortunate as to obtain prior rights to the lands along the streams a monopoly of the use of the uplands and divides without the necessity of purchasing the same, and prevents that complete occupation of the country which is necessary to its successful development.

The evil here adverted to grows in magnitude in proportion as the lands adjacent to the water-courses are occupied and inclosed under the present land policy of the government, and such occupancy and inclosure are daily becoming more extensive, so that it is but a question of a very short time, if a prompt remedy be not afforded by Congress, when this whole Territory will be in the virtual possession of these few persons who have title to the small fractions of the land along the streams.

We believe that the water-courses of the country ought to be so controlled by proper legislation that they can be made available for the common and equal benefit, so far as possible, of all persons who may choose to occupy and improve any part of the public domain, and that legislation which would secure such benefit to all alike would be to the mutual advantage of the United States and of the Territory of Wyoming.

I need only add that suitable legislation of the kind proposed would also protect the interests of stockmen, now in some cases cut off from water privileges by miles of fencing, erected by those who have in some

instances acquired control of long strips of land up and down the water-courses, for the purpose of cutting grass therefrom for the market. It is earnestly hoped that this whole subject will have early attention from Congress.

The attention of the national legislature is also called to the present faulty constitution of the Territorial courts, and the lack of proper definiteness in relation to their powers and the manner of their exercise. These courts are anomalous in character, and there appears never to have been a proper consideration of the peculiar circumstances and conditions under which they must act. The method of compelling the attendance of jurors and witnesses, of impaneling juries, the suitable compensation of marshals required to travel, in the pursuit of witnesses, jurors, and criminals, over great distances, as well as the present embarrassment attendant upon bringing witnesses from remote parts of the country—all these, with yet others, are matters concerning which the laws are faulty. The courts are of a mixed or twofold character, being at once Territorial and Federal. The organic acts of this Territory and of others declare that "the jurisdiction of the several courts herein provided for, both appellate and original, * * * shall be as limited by law." The law, as said before, is not only wanting in definiteness on this subject, leaving the courts oftentimes in doubt on the question of how to proceed in Federal cases, but is so far wanting as to leave the courts to such inconvenient and embarrassing use as they may find it possible to make of the Territorial law and its machinery. In fact, what is wanted is not so much definiteness in the matter of jurisdiction as *a procedure fixed by a law of Congress, in accordance with which the Territorial courts, may proceed when exercising the jurisdiction of circuit and district courts of the United States.*

It is also worthy of consideration whether Congress, while dealing with this general subject, should not provide some system better than the present, of determining cases on appeal from the district courts of the Territory. A court wholly composed of three district judges, each one of whom may at any term of that court be interested in the decision of the other two upon cases appealed from his own court, and is not only clothed with full authority to pronounce in the higher capacity upon his former judgment, but is also able, with the concurrence of but one of the other judges, to affirm and enforce the correctness of that judgment, and is therefore exposed to the temptation of granting concurrence for a reciprocal advantage—such a tribunal, no matter how able and upright those who compose it, cannot fully meet the requirements of a supreme court.

If circuit judges of the United States having circuits to which Territories are contiguous could sit with the Territorial supreme courts as now constituted, a great gain would unquestionably be made without much additional expense, and if this be impracticable on account of the present extent of the circuits of the United States, then the creation of a new circuit with the designation of Territorial circuit, and the appointment of a suitable person charged with the duty of sitting with each and all of the Territorial supreme courts in convenient rotation, would accomplish the object equally well.

In conclusion, under this general head, I deem it proper to urge the importance of a careful investigation of all the laws relating to the Territories, with a view to greater harmony, consistency, and adaptation to conditions. At present they are characterized in many cases

by inequalities and incongruities, which plainly show that they were enacted to meet special demands, and without sufficient regard to real needs, which for the most part are common to all the Territories, and require common legislation.

Finally, I respectfully invite attention to

**THE PRESENT INSUFFICIENCY OF THE APPROPRIATIONS MADE FOR
THE SUPPORT OF THE TERRITORIAL GOVERNMENTS.**

The salaries of public officers, in whatever branch of the service, should be fixed on the basis of two primary considerations, the character of the service to be rendered, and the legitimate cost of living under the conditions involved. This granted, it is difficult to see why a service so important, difficult and laborious as that to be performed by leading officials in the Territories, where all things—laws, institutions, public policies—need, as they will never need again, the wise and skillful molding of a careful hand, where official life is of necessity attended by many sacrifices, and where the necessary cost of living is much greater than in the older communities, should have so meager a reward as that provided for by the Federal statutes. What then shall be said of the wisdom and justice of a legislation, which during the recent years, in disregard of the necessities of Territorial officers and of their just expectations, has persisted in appropriating as full compensation sums less by 25 to 33 per cent. than the legal salary?

I cannot doubt that proper inquiry into this matter will at least result in the annual appropriation of the amounts prescribed in the statutes. It should do more—it should result in such increase of compensation in some cases as is demanded by the nature and circumstances of the service.

I have the honor to be, with great respect, your obedient servant,
JOHN W. HOYT,
Governor of Wyoming.

Hon. CARL SCHURZ,
Secretary of the Interior, Washington, D. C.

REPORT OF THE GOVERNOR OF DAKOTA.

EXECUTIVE OFFICE DAKOTA TERRITORY,
Yankton, November 8, 1880.

SIR: In reply to the request from your department of August 16, for a report of the affairs and of the progress and development of this Territory for the year ending June 30, 1880, with any suggestions I might deem proper, I beg leave to say that I was not installed in office as governor of Dakota until the 24th of June last, consequently a very small period of the time mentioned has passed under my administration, and that owing to a serious illness during September and October, I have been unable to answer your communication within the time named. The reports of my predecessor, the late Governor William A. Howard, now on file in the Interior Department, undoubtedly give a more comprehensive and accurate statement of the affairs of the Territory during the period named in your letter than any report I could make.

I will, however, endeavor to give a brief statement of the affairs of the Territory since I assumed the office, with some suggestions as to present and future requirements.

TRANSPORTATION.

The means of communication between the different portions of the Territory have rapidly improved during the past year. The Chicago, Milwaukee and Saint Paul Railway Company has extended new lines across the southern portion of the Territory, to a point called Running Water, on the Missouri River, and the same company has also built another line from Canton, via Alexandria and Mitchell, with the intention of reaching the Black Hills and crossing the Missouri River about one hundred miles above Running Water at a place called Brulé.

A number of prosperous towns have been built up on these new lines, and, in fact, where there was nothing but the trackless prairie a year ago, well-built towns, embracing from one to two hundred houses and places of business have been established.

The Chicago and Northwestern Railway Company has also extended its system of railroads from the western line of Minnesota to Watertown, and also, via Huron to Fort Pierre, on the east bank of the Missouri River. This company has also made close stage and transportation connections direct to the Black Hills. Thriving and prosperous towns have also sprung up as if by magic along this central line of communication. Railroads running north and crossing these east and west lines, connecting them with the Northern Pacific, are being pushed rapidly forward. The Northern Pacific now has nearly four hundred miles of its road completed in Dakota and it is understood that the last

spike will be driven at the Montana line this season. This wonderfully rapid extension of railroad facilities and improving river communications has aided to settle up the Territory beyond the most sanguine expectations of the earliest inhabitants, adding, as I believe, 15,000 new settlers since the enumeration was completed, making the aggregate of white population at the present time 150,000.

TOUR OF INSPECTION.

During the months of July and August last I made a tour of inspection of nearly all the principal points in the Territory, passing up the Missouri River to Fort Sully, stopping at the military posts and agencies along the river. From Fort Sully I took transportation across the great Sioux Reservation to Fort Meade and the Black Hills, where I spent several weeks making a careful inspection of the mineral and agricultural resources of that rich and fertile region.

MINING.

I was present by invitation, and saw the reduction and smelting into bars the gold from two weeks' clean-up of the quartz-crushing mills, belonging to the Homestake Mining Combination, which was valued at over \$150,000, showing an average annual yield of gold from 400 stamps of about three and one-half million of dollars.

The Father De Smet mines, the California, and many others produce fully as high grade ore as the mines to which I have referred, although none of them have such heavy and expensive machinery as the Homestake.

The silver mines are also being developed in many places around the hills, and there seems to be hardly any reason to doubt that the Black Hills will yield vast quantities of gold and silver for generations to come.

WASTE OF TIMBER.

The fine timber which grows all around the hills, belonging to government ought to be preserved, as it will be required for properly timbering the mines and for building purposes; and in order to accomplish this result, I would recommend that an agent be appointed and authorized to sell timber for mining and building purposes; also to employ men during the dry season, who live in the heavily timbered sections, to put out fires when they are first started, and to aid in bringing to justice those who set these fires through carelessness or with criminal intent. A small sum expended in thus protecting the government timber, will save millions of feet yearly, and unless something is done to stop these great fires that rage through the mountains every season, and to prevent depredations upon this valuable timber, tunneling the hills, and excavating the gold-bearing rock will come to an end, for want of timber to properly protect the miners while working hundreds of feet under these mountains. The valleys around the Black Hills are exceedingly rich, and produce all kinds of cereals and vegetables in abundance.

BLACK HILLS AS A SUMMER RESORT.

The scenery around the eastern and southern hills is charming, and the pure water and bracing air always to be found there during the heated term will induce thousands to quit the populous western towns,

and seek the Black Hills as a place of summer resort, as eastern people seek the White Hills, in New Hampshire, whenever the railroads now being built are completed to this new Eldorado.

UTILIZING INDIAN LABOR.

From a casual examination of the Indian reservation along the Fort Pierre route to the hills, and also from the hills to Bismarck, I see no reason why a large proportion of the whole Sioux Reservation could not be utilized for stock raising and agricultural purposes, at least to a sufficient extent to feed the Indians now there. If a change in the policy now pursued by the government could justly be made, so that the Indians could be employed by the Indian agents at a moderate price per week, and thus utilize their labor to raise the stock and agricultural products now purchased and conveyed to them long distances at great expense, it seems to me this plan would greatly benefit the Indians and prepare them for independent action, and at the same time save large sums which the government could hold in reserve for those unfit to be made self-supporting.

If these stalwart braves can take (as some of them have been doing for the past year) from two to four horse teams, and freight Indian supplies from the Missouri River one and two hundred miles to the Indian agencies at a fixed price per ton, would they not gladly take the same teams and drive the plow, seeder, and harvester or serve as herdsmen in care of stock for a moderate weekly payment?

There are about 50,000 square miles of Indian reservation in Dakota. Will not that land support an average of one Indian to the square mile under the agricultural system I have indicated, at less than one quarter of the present cost to the government, and leave every Indian in ten years with his land in severalty and ready to become self-supporting?

The foregoing are thoughts and questions respectfully submitted for future consideration.

THE WHEAT HARVEST.

At Bismarck I found that the wheat harvest had just commenced, and all along the line of the Northern Pacific Railroad from Bismarck to Fargo, the countless acres of golden wheat were falling before hundreds of self-binding harvesters, all in active operation. The average yield of wheat in Northern Dakota the present season is estimated at from 25 to 30 bushels to the acre, but in Middle and Southern Dakota, wheat has not done as well, although I am unable to find any section of the Territory where any crop has proved a total failure.

I have been unable to obtain the census report, showing what number of bushels of wheat Dakota produced last year, but I think it may be safely estimated that the crop was nearly one-third larger the present year than the census report of last year's crop shows.

Dakota number one hard wheat produces the best flour to be found in the market, and although millions of bushels are shipped away, flouring-mills are being erected all over the Territory, one of the first having recently been built at Sioux Falls, with a capacity for producing 1,200 barrels daily.

Nearly every branch of mechanical and manufacturing industry seems to be getting a good foot-hold, and the people in every section of the Territory which I have visited appeared to be hopeful and prosperous.

DEPREDACTIONS ON SCHOOL LANDS.

The sections of land donated by Congress for educational purposes whenever State organizations are perfected, are being depreciated in value because the law seems inadequate to prevent trespass upon them. I have called the attention of the United States district attorney and the courts to the depletion of what was intended by Congress as a sacred fund for the education of the rising generation, and have been advised that additional legislation by Congress is necessary for the protection of these school sections.

TERRITORIAL LEGISLATION.

The territorial legislature is altogether too small for the accumulating legislative business, composed as it is of only 12 members in the council or upper house and 24 members in the lower house. The members of both houses are elected from districts covering 75,000 square miles, now inhabited by 150,000 people, and are necessarily rather unequally distributed.

I respectfully but earnestly suggest that the number in each house ought to be doubled at the coming session of Congress.

The population and business of the Territory having increased more than ten-fold since the number was originally fixed, an increase at once is, in my opinion, imperatively demanded in order that the people may have proper representation when measures are considered looking to the organization of one or more States from this Territory.

INSUFFICIENT APPROPRIATIONS.

I would also call attention to the neglect of Congress in not appropriating the amount fixed by the organic act for the salaries of the judges and other Territorial officers. These officials have to travel long distances to attend to public business in this large Territory and expenses of living in new towns is sometimes greater than in populous cities; the business constantly pressing upon the officers in the Territory is ten times more than that of some of the other Territories, while the appropriation made has been the same in all.

I trust that Congress will see that it is but a simple act of justice to appropriate the amounts fixed by law for the officers of Dakota.

PENITENTIARY AND INSANE ASYLUM.

Although the general government has derived large revenues from the public lands and is constantly leaving among us persons discharged from the Army and Indian agencies who become criminals and insane people, no appropriations have yet been made by Congress for the erection of an insane asylum or penitentiary, leaving an annual expense upon the people of the Territory of nearly ten thousand dollars for the conveyance of convicts to Detroit, Mich., that being the nearest point that could be secured for their safe keeping. Forty thousand dollars would build a penitentiary of sufficient capacity for the present requirements of the Territory, which sum could be saved in four years on the single item of transportation.

A temporary insane hospital was provided under Governor Howard's administration, which has served, by making additions thereto, to alleviate in some degree the sufferings of this numerous and unfortunate

class. The building, which is of wood and but one story high, is now overcrowded, and applicants are waiting in jails and poor-houses for some place where they can be properly treated and cared for.

I sincerely hope Congress may be induced to appropriate one hundred thousand dollars this winter for the erection of a penitentiary and a suitable insane asylum at the proper points in this Territory. I believe almost all of the other Territories have been favored with similar appropriations.

FINANCIAL CONDITION OF THE TERRITORY.

The financial affairs of the Territory are getting into a satisfactory condition. Two years ago the Territorial warrants were selling at 70 cents on a dollar, and Governor Howard, in his communication to the department, expressed fear that bankruptcy would ensue; these warrants are now selling at par and we hope to be able, owing to the increased revenue from new capital which has come into the assessor's list since that time, to pay off every dollar of outstanding indebtedness by the time the legislature meets, and start the year 1881 with a clean balance sheet.

The county of Yankton has a burdensome debt hanging over it for aid extended to a railroad, and the county of Lawrence, in the Black Hills, has been loaded down with a fraudulent and unjust debt of several hundred thousand dollars, through the manipulations of a corrupt but powerful ring. With these exceptions the financial condition of the various counties in the Territory is in a hopeful condition.

EDUCATIONAL SYSTEM.

The educational system inaugurated under Governor Howard's administration is being developed, and I trust will soon be placed upon a sound basis, although the lack of funds and imperfect organization has prevented the accomplishment of all that its friends anticipated. Several high schools, academies, and institutions of learning, have been founded during the past year; among these may be mentioned the Spearfish Academy, situated at Spearfish in the Black Hills.

I assisted in laying the corner-stone of this institution in July last, and the work has been pushed forward with such rapidity that the building was completed by voluntary contributions and opened for the uses intended within four months.

The location of this institution is one of the finest in the Territory, standing as it does upon a beautiful eminence just back of the town and commanding a full view for miles of the beautiful and fruitful Spearfish Valley.

TERRITORIAL MILITIA.

The legislature, several years since, enacted a comprehensive law, which has never been put into operation for want of arms and equipments.

The War Department has charged to the Territory large quantities of arms and ammunition drawn under Governor Faulk's administration for the ostensible defense of the Territory against Indian raids, &c., but which were really distributed to irresponsible persons who lost them, or, possibly worse, sold them to Indians.

With this charge against the Territory, the War Department has declined to furnish arms for the Territorial militia, and the law has remained a dead letter.

There are now in different portions of the Territory, independent military organizations who are anxious to be enrolled as a part of the Territorial militia, provided arms and equipments can be secured for them.

As the arms now charged against the Territory never came into the hands of the militia, it would seem but just that the charge for them against the Territory should be canceled and placed to some other account, and that the Territory be furnished with the quota designed for its organized militia, and thus enable the executive to carry out the Territorial enactments.

A reasonable number of efficient military companies located in different sections of the Territory, would be conservators of the peace and useful in case of incursions from hostile bands of Indians, and keep alive the martial and patriotic sentiments of the people.

In this connection, I am happy to add that peaceful and amicable relations have been maintained between all of the various tribes of Indians and the people of Dakota during the past year, and that, with the exception of occasional raids by small bands of young bucks or wild Indians, very few depredations upon whites have occurred.

It seems to be the policy of the principal chiefs to take their grievances against the whites before the courts and to surrender to the Indian agents for trial, in the same manner, bad Indians charged with crimes and outrages.

In conclusion, I may be permitted to add, that I have found the condition of the Territory much more prosperous than I had anticipated, and that its advancement during the coming year bids fair to far exceed any like period in the past, and I shall be most happy at any time to furnish such further information or suggestions as the department may require.

Respectfully,

N. G. ORDWAY,
Governor.

Hon. CARL SCHURZ,
Secretary of the Interior.

REPORT

OF

THE GOVERNOR OF IDAHO.

EXECUTIVE OFFICE, IDAHO TERRITORY,
Boise City, October 6, 1880.

SIR: In compliance with your request of August 16th last, I have the honor to submit, herewith, a report of the condition of affairs and of the progress and development, in so far as that is possible, of the Territory of Idaho for the year ending June 30, 1880.

Owing to the fact that I have only recently entered upon the duties of the governorship, the task of preparing this report has been an exceedingly difficult and embarrassing one. There is no record showing the *status* of affairs, especially as respects the progress and development up to the year ending June 30, 1879. Consequently the advance made during the past year could, at least, only be estimated. Moreover there is no bureau or other method provided for the collection of statistics of the resources, industries, products, &c., of the Territory; nor is there any provision of law requiring local officers to respond when called upon by the governor, to furnish information relative to such matters. Under these circumstances it has not been possible to obtain complete and reliable information upon all the points about which inquiry is made.

In view of these facts I deem it best to make no attempt to show the exact progress and development of a year, but, instead, give the present condition of affairs in the Territory, with as full a statement of its resources, industries, and products, as it has been possible to obtain in the brief time I have had for the purpose.

GEOGRAPHICAL DESCRIPTION.

Idaho Territory, sometimes called "Gem of the Mountains," lies to the north of Utah and Nevada, which form its southern boundary. It extends to the north over 400 miles to the British possessions, which, at the 46th parallel, form its northern boundary. On the east it is bounded by Montana and Wyoming, and on the west by Oregon and Washington, the wonderful Snake River forming, for a distance of 50 miles, the dividing line.

AREA.

In area it comprises more than 86,000 square miles, or over 55,000,000 acres. These lands have usually been described as agricultural, desert, mineral, and timber lands, but the exact quantity of each kind can only be approximated. The best estimates classify these lands as follows:

Suitable for agriculture in their present state, 12,000,000 to 15,000,000 of acres; capable of being reclaimed by irrigation, 10,000,000 to 12,000,000

of acres; pasturage or grazing lands, 5,000,000 of acres (although much of the land described as agricultural is suitable and is, in fact, used for grazing); timber lands, 10,000,000 of acres; mineral lands, 8,000,000 of acres. There is at least 5,000,000 of acres, mostly arid desert, or volcanic formation, unfit for any use, being destitute of mineral, timber, or vegetation of any kind whatever.

CLIMATE.

In the valleys and agricultural portions of the Territory the climate may justly be designated as salubrious. The equable temperature and cool nights, the bright winter and summer skies, so common to the Rocky Mountain regions, prevail and reach perfection in Idaho. In the high mountain altitudes the winters are long and severe, but the pure, dry atmosphere renders it possible to endure them without discomfort or suffering.

SOIL.

The soil of the mountain regions is generally sandy and rocky; that of the lower hills and slopes, composed of decomposed granite and sandstone, produces good crops of natural grasses, and affords fine ranges for grazing purposes. The soil of the table lands is similar, with here and there rich loam intermixed, from which good crops are produced. The soil of the valleys is generally a sandy loam, rich and mellow, well-adapted to the growth of all kinds of grain, fruit, and vegetables.

RIVERS, SCENERY, ETC.

Though one of the largest and most interesting of the Territories, Idaho is probably the least known. It abounds in swift, noble rivers, beautiful, placid lakes, grand scenery, and fertile valleys, while its rugged mountain ranges are filled with the precious metals—an Eldorado indeed!

The principal rivers are the Snake, Salmon, Boise, Clearwater, Kootenai, Bear, Malad, Raft, Payette, and Weiser, all clear, strong streams, grand currents, worthy of their mountain sources. These streams, and all others in the Territory, are well stocked with the most palatable food fishes—trout, salmon, white, and numerous other species. To the tourist, the pleasureseeker, the scientist, and the sportsman, the Territory presents distinctive and attractive features not excelled elsewhere on the continent. It is not possible to mention even the chief points of interest, but it may not be amiss to note the fact that Idaho has one of the greatest cataracts in the world, the great Shoshone Falls of Snake River, equal in height and volume of water to Niagara, and far exceeding it in beauty and grandeur of natural scenery.

Wild game of all kinds is abundant, and the sportsman cannot fail to find, in the way of the pleasures of the chase, or the exercise of the angler's art, all that the most exacting disposition could demand. The invalid will find the waters of the numerous mineral springs very beneficial and invigorating. Here the scientist can study the most wonderful of nature's phenomena, and speculate to his heart's content.

AGRICULTURE AND FRUIT.

The number of people engaged in the pursuit of agriculture is unknown to me, but I think it entirely safe to state that at least one-third of the population are farmers and ranchers. The past year has been a

remunerative one for this interest; good crops have been raised, and high prices generally obtained therefor. As before stated, not to exceed 15,000,000 acres of the total area of the Territory are suitable for agriculture in their natural state.

The principal agricultural settlements are in the counties of Ada, Cassia, Bear Lake, Nes Percé, Oneida, and Washington, though every county contains fertile lands, small valleys, where there are families and settlements engaged in agriculture.

In the northwestern counties adjoining Washington the rainfall during the growing season is usually sufficient to insure good crops, and artificial irrigation is seldom resorted to. Elsewhere in the Territory crops can be raised in that way alone. Where the supply of water for irrigating is abundant, the soil produces excellent crops of all kinds of grain and vegetables. It is no exaggeration to state that, with the one exception of corn, a better quality of grain cannot anywhere be produced. Wheat yields readily an average of 40 bushels to the acre, and in Western Idaho 65 to 70 bushels is not infrequently the average. Oats average 60 to 70 bushels to the acre, and barley 30 to 40. Hay of good quality, timothy and clover, is grown. Vegetables are of excellent quality, and large in size.

Fruit trees and vines grow very rapidly and produce prolifically. Idaho apples, pears, peaches, grapes, nectarines, apricots, and berries are justly celebrated for their superior size and luscious quality.

I greatly regret that it has not been possible to obtain a statement showing the products of the soil during the past year, and the value thereof, as I feel satisfied the exhibit would prove gratifying to all persons interested in the welfare and prosperity of the Territory. That this interest is larger than ever before, and that it will continue to increase rapidly, there can be no doubt, now that experience has demonstrated beyond controversy the adaptability of climate and soil to the purposes of agriculture. It is not long since the opposite view very generally prevailed.

Those who wish to avail themselves of the pre-emption or homestead laws, to secure homes on the public domain, can find vacant tracts in almost any of the desirable valleys.

In the Boise City land district the land taken up under the different laws for the disposal of the public lands and upon which final proof has been made amounts to 92,081 acres. The lands upon which claims have been initiated under said laws, about 400,000 acres.

This statement does not include settlements upon unsurveyed lands, but granting that the amount of such lands settled upon is equal to or greater than the amount shown in the above statement, it will be seen that but comparatively a small portion of the government lands in Idaho has been settled upon or disposed of.

There are large tracts of unoccupied government lands within the Boise City district quite as good as any that have been disposed of. Big Camas Prairie, containing over 100,000 acres, particularly well adapted to wheat-growing, would be a desirable locality for the settlement of large colonies. The valleys of Wood River also present admirable advantages for such settlements. Twenty-five hundred families could find good homes in these two localities. Their nearness to what bids fair to be the greatest mining district of the West, would insure a good market, where ready sale, at high prices, would be found for all the products of the soil.

Little Salmon Meadows, Indian and Long Valleys, in the northern portion of the Territory, will afford good homes for at least two thousand

families, while on the Weiser and Payette Rivers there are still large bodies of unoccupied land of an excellent quality.

In the Oxford land district about 85,000 acres were entered and disposed of from September 1, 1879, to June 30, 1880. The whole number of acres entered and disposed of in the district since the organization of the Territory is 342,178.

The building of the Utah and Northern Railroad through Eastern Idaho has been a great benefit to that portion of the Territory. The population has increased rapidly, and thriving, enterprising towns have grown up where but a short time since silence and desolation reigned supreme.

The line of the government surveys should be extended over the lands in Lemhi and Lost River Valleys. There are large settlements in those valleys (in many instances on unsurveyed land) with farms well fenced, the land under a good state of cultivation, and with good substantial houses for residences. Settlement is greatly retarded in many places by the failure to survey the land, as no one desires to settle upon and improve land for which he cannot at once initiate a claim under the pre-emption or homestead laws. I would suggest that the appropriations for the survey of government lands in the Territory should be largely increased. The policy, so often resorted to of late, of making settlers in an unsurveyed locality contribute the amounts necessary to have their claims surveyed is small business for a great nation like ours to engage in. There should never be necessity for such expedients. The public domain should be surveyed as rapidly as possible, so that settlers may initiate their claims immediately upon settling thereon. The policy of making small annual appropriations, sufficient usually for the survey of about one township in a district, is not economy.

STOCK-RAISING AND GRAZING.

This is one of the most considerable interests in the Territory. Experience has demonstrated its advantages as a grazing region, and the number of persons engaged in the business of stock-raising and grazing is very large. Here, again, the absence of statistics makes it impossible to do full justice to the subject.

The ranches are large, well watered, and covered with "bunch" and other nutritious grasses, indigenous to the soil. Stock men have devoted themselves to the raising of cattle; wool-growing having received but little attention, as yet, though the climate and soil are admirably adapted to that purpose. During the summer months cattle, sheep, and horses range on the foot-hills and lower mountain slopes. In the winter they are driven to the ranges in the valleys, where the temperature is mild and snow seldom, if ever, falls. Provision is, however, always made to meet exceptional winters, which occur not oftener than once in five years. For these, hay is cut from the natural meadows and stored upon the ranches. An excellent quality of beef is raised without resorting to stall-feeding or the use of prepared food. While it is impossible to give the number and value of the stock raised and owned in the Territory, good judges estimate that not less than 40,000 head of Idaho cattle have been sold and driven from the Territory to Wyoming and other points east and west during the past season. This estimate is probably under rather than above the exact number sold. The value of this stock would exceed \$500,000.

MINES AND MINING.

The mineral resources of the Territory constitute its chief interest, the one upon which all other interests are largely dependent. It is to the discovery of gold and silver on the Pen d'Oreille in the year 1852, and subsequent rich discoveries elsewhere of the precious metals, that we are indebted for the organization of the Territory, which was formed in 1862, with its present boundaries.

The occupation in those days of a large portion of the Territory by hostile Indians rendered prospecting a dangerous undertaking, and prevented any very general exploration of the country. Many of the mines first discovered were soon worked out, and a large portion of the mining population, unable to prospect with safety in Idaho, left the Territory to seek in other and more recently discovered mineral regions the fortunes they had failed to find in this. From these causes combined the mining interests of the Territory received a severe check, and the development of its mineral resources was greatly retarded. But prospecting and exploration did not cease entirely, and though development has been slow, it has been, nevertheless, certain. New and important discoveries of mineral ledges and placer deposits have been made from time to time until now there is scarcely a county or section in the Territory that does not contain one or more mining camps or towns.

Of recent discoveries perhaps the most important are those known as the Salmon River and the Wood River districts—the former in Lemhi County, and the latter in Alturas County.

The latter is the banner county in the way of new discoveries, and although in neither the Saw Tooth or Wood River districts have the lodes been explored to great depth, enough has been accomplished to show the existence of a mineral belt 55 miles in length and 10 miles in width, carrying large quantities of the finest ores. Both mining experts and practical miners agree that all the indications are favorable to the view that the lodes go to "the deep," and that the development already made is sufficient to assure their permanency. North of what is known as the Wood River Divide the lodes contain silver ores, principally native, ruby, brittle and sulphurets of silver. South of the divide the veins are large and fine, with silver bearing galena, carbonate, sulphate, molybdate, antimonate, arsenate, and chloride of lead, and grey copper ores. With the advent of next spring it is believed stamp-mills and smelters will be erected for crushing and smelting the ores of these splendid mineral districts. With these and increased facilities for the transportation of the ore and bullion produced, and the bringing in of needed supplies of all kinds, the bullion production of the Wood River region is likely to equal that of all other districts of the Territory. Of the noted claims in this region, mention may properly be made of the Bullion, Ophir, May Queen, and Evergreen in Mineral Hill, all the property of the Wood River Gold and Silver Mining Co. In the lower Wood River County there are two camps, known as Jacob's and Callahan's. Many locations have been made in these districts upon which considerable work has been done. Shipments of ore have been made to Salt Lake City which average from \$150 to \$200 per ton. The ores are galena, easily smelted, carrying from 40 to 60 per cent. lead and \$80 to \$250 in silver.

In the Warm Springs Creek district several good mines have been discovered. The "Idaho," located in 1879, contains a large body of antimonial silver, assaying \$80 to \$200 per ton. Adjoining the Idaho is the Wood River mine, in which a good body of ore has been exposed, assaying \$150 per ton. The Black Horse mine contains a good quality

of galena ore. The mines of the Upper Wood River district are similar in character to those of the Middle and Lower Wood River districts. Many locations of great promise have been made. A thriving town called Galena City has sprung up, and everything promises well in the district. The mineral belt in this district seems to be a network of veins, with prominent croppings often traceable for thousands of feet.

Many fine towns have grown up lately in the Wood River country, among the most important of which are Bellevue and Ketchum.

In the Saw Tooth district a large number of valuable claims were located in 1879, and many more have since been discovered and located. The famous Pilgrim mine, recently sold to San Francisco parties at a high price, is located in this district. Of other mines of a prominent character the best known are the Lucky Boy, the select ores from which carry \$10,000 in silver per ton—the Vienna, the Emma, Ruby Lion, Columbia, and Custer.

The Caribou district, situated near the eastern border of Oneida County, was at one time the scene of a great mining excitement. Large placer deposits were discovered, and for a while yielded largely. Placer mining is still followed to some extent, but the wealth of the district lies in its auriferous quartz lodes.

MINES OF THE SALMON RIVER.

The rich discoveries in Bay Horse district, on the Salmon, has extended the reputation of the district far and wide. It is seldom that an ore body is found of the magnitude of that known to exist in the General Custer mine. The development in this mine some months ago was sufficient to expose to view more than three million dollars. That is the estimated value competent experts placed upon the ore then in sight. The Charles Dickens mine, discovered in 1875, is another of the valuable claims in this district. In one month after the mine was discovered the owner pounded from top rock with a hand-mortar \$11,000. In 1878, with an arastra run by water-power, over \$32,000 were taken out of the mine in six weeks. Another of the famous mines of this district is the Montana, which has been self-supporting since its discovery, and for this reason has been styled "the Poor Man's mine." The vein varies from five to fourteen feet in thickness, from which the ore taken averages from \$500 to \$1,700 per ton. The quartz carries gold and horn silver. There are many other valuable mines in this district, among which may be mentioned the following as having a good reputation: The Unknown, Mount Estes, Lucky Boy, Badger, and Charles Wayne. Placer mining is also a large interest in this district, and many valuable claims are being worked with good results. Among the best of this class of claims are those known as the "Morrison" and the "Bray."

There are a number of fine placer claims in the Stanley Basin district, and the annual yield of gold from this district is not less than \$30,000. Deposits of cinnabar have also been found here, the only place where it has been discovered in the district.

Ten miles from Challis City is the Bay Horse district, which is also deserving of special mention, as within its limits every conceivable grade of ore is found, the smelting ore being exceedingly rich. Chief among the mines of this district are the Ramshorn, Beardsley, Hood, Vermont, and Bull of the Woods, all producing handsomely. At Poverty Flat, a portion of this district, are the Silver Bell, Mono, Ella, and the Redemption, the latter being at this time regarded as an exceptionally fine prop-

erty. On the East Fork is the Germania, also a good mine. The placers between East Fork and Yankee Fork, are also yielding handsome returns.

The mines of the Salmon City region produce free gold ore, from which \$15 to \$40 per ton are extracted. The Ranger, Eldorado, California, Freeman, and Shoo Fly, are all good mines, from which ore in paying quantities is being taken. From the placer mines in the Leesburg, Moose Creek, Arnets Creek, Kertley Creek, Gertson Creek, and Bohanan Creek, the annual yield of gold is not less than \$200,000, and judging from present indications are likely to keep up production at this rate for twenty years, or longer.

In the Prairie Basin district, valuable discoveries have been made of very high grade ores, but owing to difficulty of access the district has not produced much ore. This disadvantage will be overcome shortly, and it is believed the district will become a valuable one. The same remarks apply to the Yellow Jacket district, where immense deposits of ore have been found. The North and South America mines situated in this district, are regarded as valuable claims.

The facilities for working and handling the ores of the Salmon country are rapidly increasing. The Omaha smelter in Bay Horse district, recently completed, in a run of two weeks produced from the ores of the district \$60,000 in bullion, and the managers are well satisfied this average can be maintained for an indefinite period.

A smelter erecting at Clayton, in the Kinnikinick district, will be in operation in a few days. Two new stamp-mills are going up in the Yankee Fork district; one sixty-stamp mill at Bonanza City and a ten-stamp mill at Custer City. Two arastras have been in operation in this district during the past year, and by this primitive method over \$100,000 in bullion has been produced.

Fifteen miles from Salmon City is the twenty-stamp mill of the Eldorado and Ranger. On Moose Creek there is a five-stamp mill at work on the ores of the "Shoo Fly" mine; at Gibbonsville a ten-stamp mill and at least ten arastras operating on the gold ores of the North Fork district.

The Yellow Jacket district has a three-stamp mill in operation.

It is estimated that with improved facilities for transportation, sure to be obtained soon, the mineral output of the Salmon country will reach \$500,000 per month, without increasing present facilities for smelting and crushing the ores.

Placer mining is, and has always been, a feature in Idaho. Perhaps the most extensive field for this industry in the future will be the bars of Snake River. Throughout almost its entire length these bars contain vast deposits of what is called "flour gold." It was not until recently that any method had been invented for saving these fine particles. With the process now employed of washing the dirt over silver-plated copper plates, coated with mercury, the fine gold can be saved in paying quantities. The machinery is simple and the bars can be worked on an extensive scale with but slight cost.

In Ada County very little has been done the past year toward developing the mines located in the northern part of the county. Coal beds, and rich deposits of the finest quality of fire and pottery clay, have been discovered, but up to the present time nothing has been done to develop them.

In Boise County some very promising quartz lodes have been discovered within 10 miles of Boise City. The ore will probably mill from \$15 to \$20 per ton, requiring economical working and a first-class mill

of large capacity to leave a margin for profit. The Elmira Company in Banner, and the Gold Hill Company in Quartzburg, have been steadily at work, and both have realized large profits. Placer-mining in this county has again declined, and a large majority of the claims are now only worked successfully by Chinese.

Owyhee has not wholly recovered from the blow received in 1876. A smelter is erecting in South Mountain, which, when completed, will give the poor owners of mines a chance to sell their ore at a profit, and tend to prosperity in the future.

In Atlanta the Buffalo Company has struck the richest ore body ever encountered in their lode, and in Rocky Bar increased activity is also perceptible.

In closing this portion of my report I desire to add that I am satisfied complete justice has not been done to the wonderful mineral resources of the Territory. That there are mineral districts not mentioned in these pages, there is no doubt. That there are better mines in many of the districts than those named herein is quite likely, but I have not been informed respecting them, and have alluded to such only as I have been assured by reliable parties would bear out the statements made respecting their value.

Since the first discovery of gold and silver in Idaho, the Territory has contributed from its mines to the material wealth of the country not less than \$75,000,000,

The output of the mines for the past year may not exceed \$3,000,000. This is not a large increase over last year, but significant in connection with the fact that from 1867 up to last year the production was constantly decreasing.

From present indications the production for next year will equal, if not exceed, any year of the palmy days prior to 1867.

INDIAN AFFAIRS.

There have been no disturbances during the past year with the Indians—no depredations by them, and the people have enjoyed unusual security in pursuing their avocations, even in those portions of the Territory most exposed to danger.

During the Bannock war about thirty of the Sheep Eater and Weiser Indians escaped from the troops, and secreted themselves in the rugged and almost inaccessible mountains of the Salmon River, from whence they raided remote and unprotected settlements, murdering several citizens in the spring of 1879.

General Howard took prompt action to relieve the people from their danger, sending two companies of troops in pursuit of these treacherous savages, and after a long and toilsome chase, lasting all summer, finally succeeded in capturing the band late in the fall of 1879. They were taken to Fort Vancouver, where they still remain. Fearing, however, that some of the band might have escaped their pursuers, a detachment of scouts, with Indian guides, under command of Lieut. Farrow, was sent out during the past summer to scour the Salmon Mountains. All the old hiding places were visited, and after a thorough and vigilant search Lieut. Farrow's command has returned without having seen any hostile Indians. The fact that no settlers have been murdered or depredations committed during the past year is regarded as conclusive evidence that all of the cruel and murderous Sheep Eaters were captured last year. It is to be hoped they will be kept where they can do no further harm.

The Salmon county has long been known to be rich in precious metals,

but the hostile character of the Indians who infested that region for years, kept the prospectors out. The past summer, the Salmon Mountains have been filled with prospectors, who have pursued their explorations without fear of molestation. The capture of the Indians, and their detention elsewhere, has given security to the miner and prospector, and the result has been the opening up of one of the richest mineral portions of the Territory.

The Nez Percé and Bannock wars created so much distrust and hostility toward the Indians, that the reservation Indians, either from fear or a disposition to observe more sacredly treaty obligations, have remained upon their reservations.

So long as the Indians are permitted to maintain tribal relations, and reservations are set apart for their exclusive use and benefit, they should be confined more closely and strictly to the reservations. Large parties of these Indians roam over the Territory almost incessantly, hunting, fishing, and begging. The appearance of these parties in remote and isolated settlements of the Territory, creates an uneasy feeling in the minds of the settlers. They are apt to regard such visits as dangerous to their peace and security, and acting upon their suspicions, drive the Indians away by force if necessary. From such collisions come long devastating Indian wars. The people of Idaho have suffered so much from the cruelty, hatred and treachery of the Indians, that it is not surprising they have little faith in the professions of friendship made by their old enemies.

Long prior to the time when the Fort Hall Reservation was set aside for the Bannock Indians there were numerous settlers upon portions of the territory selected, who still remain within its boundaries. This fact may cause trouble, and I would suggest that those settlers be paid for their improvements, and removed, or a stipulation made with the Indians by which that portion of the reservation settled upon by whites might be ceded to the government. The latter would be the best course, as the reservation, originally intended for the Bannock and Shoshone tribes, has never been occupied by the former, and contains a much larger area than is needed for the one tribe. I think the Indians would readily consent, upon reasonable terms, to the restoration of a large portion of the Fort Hall Reservation to the public domain.

The majority of the Bannock Indians west of the Rocky Mountains are under Tendog, and have a reservation in Lemhi Valley. They have always refused to go upon the Fort Hall Reservation, and spend most of their time hunting east of the Rocky Mountains with other friendly tribes. It is hardly possible for them to make a living on their reservation in Lemhi Valley, and I am informed they would gladly consent to a transfer to the reservation of a friendly tribe east of the Rocky Mountains.

The Nez Percé war depleted the ranks of that tribe, happily eliminating the nomadic portion, and instilling into the minds of the remainder a disposition to remain at home and endeavor to earn a living by farming and pasturage. Many of these Indians are now thrifty farmers, and are doing far better than when their main dependence was in hunting and fishing. It is my opinion that the members of this tribe could be prevailed upon without difficulty to select land in severalty. If this were done, a large portion of their reservation could be restored to the public domain. The Nez Percé Reservation embraces a large area of very valuable agricultural land that ought to be opened up to settlement. The policy of placing the Indians upon the same footing as white men, with respect to the right to enter and own land, is a wise

one, as tending towards their civilization, and the opportunity now presented of proving the wisdom of that policy should not be neglected.

Recently trouble has been apprehended with the small tribe known as the Shoshone or Duck Valley Indians, who live on the line between this Territory and Nevada. Prior to the settlement of the Bruneau Valley these Indians spent the winters there, and claim the right to do so now. The settlers have secured title to their lands from the government, and of course the Indians can have no valid claim to the lands. The Indians have recently appeared in the Bruneau Valley, causing much apprehension in the minds of the settlers, who fear trouble with them. Colonel Parnell, in command at Fort Boise, has orders to investigate the affair, and the Indians will, no doubt, be induced, without a conflict, to return to their own grounds. They should, however, be compelled to remain upon their reservation. If they go again into the Bruneau Valley, asserting a right to the land, the settlers may not be as patient and merciful as they have been in the past.

Upon the whole it may be said that the people have enjoyed a year of unusual peace and tranquillity with the Indian tribes of the Territory.

TIMBER.

The forest areas of the Territory have been variously estimated at from 8,000,000 to 10,000,000 acres. The latter estimate is probably more nearly correct than the former. There are considerable bodies of timber along the rivers and smaller streams, but the great forests are in the mountains. These consist largely of pine, fir, and cedar.

In order to obtain fuel and timber for domestic purposes, a majority of the citizens of Idaho are compelled to constantly violate the provisions of the act of June 3, 1878. It is not possible for each individual citizen to go into the mountains and procure his own lumber and fuel; nor is it possible for each person to appoint an agent to do this for him. The timber is found in the most inaccessible mountain ranges, to reach which and bring it out necessitates the building of wagon-roads, often at considerable cost.

The people of Idaho obtain their supply of fuel and lumber from men who engage in the business of cutting wood and manufacturing lumber. Saw-mills have been erected at various points, and it must be admitted that the owners of these mills do not, in all instances, insist upon having instruments in writing, designating such owners as agents of the parties to whom they sell a bill of lumber or load of fuel.

The law of 1878 should be amended so as to provide for the survey and sale of the timber on the public lands.

I would suggest that only alternate sections be sold, every other section being reserved by the government, and a heavy penalty attached for cutting or destroying the timber on such sections.

In this way the wants of the people could be easily supplied, and an interest created that would prevent the wanton destruction of timber, which the present law does not do.

POPULATION.

The inland and isolated situation, and the want of easy communication to its borders, have prevented a rapid increase of population in the Territory. The building of the Utah and Northern Railway through Eastern Idaho has had the effect to largely increase the population of that section, and has added greatly to its prosperity.

By the census of 1870, the population of Idaho was given as 20,588. The census of 1880 gives the Territory a population of nearly 40,000 (including Indians)—an increase of nearly 100 per cent. in ten years. Judging from the present outlook, it is not unreasonable to expect that, before the end of the decade upon which we have just entered, Idaho will have a population sufficient to entitle it to admission into the sisterhood of States.

RAILROADS.

There is at present but one railroad in the Territory, the Utah and Northern—a very lively protégé of the Union Pacific Railway Company. The road is a narrow-gauge, but a first-class one in every respect. For a new line the road-bed is in splendid condition, and there is no railroad in the country, unless it is the parent line, excelling it in equipment, rolling stock, station-houses, &c. The Pullman sleepers run upon this road are models of beauty, elegance, and comfort.

Other lines have been projected to various points in the Territory, the most important of which is the proposed line from Ogden, Utah, to some point on the Pacific coast in the State of Oregon. The engineers of the Union Pacific Railway Company are now engaged in making a working survey for the purpose of demonstrating the practicability of the proposed route. This line, if built, will pass through or near Boise City, the capital of Idaho, and will not only open up an immense region to settlement and traffic, but will also bring New York City several hundred miles nearer Yokohama than the present route.

STAGE LINES.

The Utah, Idaho and Oregon Stage Company run daily stages from Boise City, Idaho, to Kelton and Winnemucca, on the Central Pacific Railroad, connecting at those points with through trains east and west. The same company runs a daily line from Boise City to Walla Walla, the Dalles, and other points in Oregon and Washington Territory. The coaches, stock, and "home stations" of the company are excellent, and every attention is paid by its agents and employés to the comfort of passengers.

There is also a first-class stage line from Blackfoot, on the Utah and Northern, into the Wood River country, connecting with a line from Rocky Bar to Boise City. It is not possible to mention all the stage lines, but, as most of the travel in the Territory is by stages, good lines have been established wherever there is necessity for them.

DESERT LANDS.

As has been elsewhere stated in this report, at least one-half of the land in Idaho suitable for agriculture cannot be made available in its present state. There are large tracts lying along the Snake River which can be reclaimed by means of canals taken from that stream. The expense attending an undertaking of that nature is too considerable to admit or insure of its being done by individuals.

The amount of land one person may enter under existing laws is insufficient to induce investments in irrigation schemes on a large scale. Nor can it be expected that an enterprise which will not pay one man to undertake alone will prove more attractive to a number. The amount of land a company composed of ten or twelve persons could secure under present laws would not excite the envy of the most rampant communist.

The desert-land act should be amended so as to permit the disposal of this class of lands in unlimited quantities, at a small price, to individuals or corporations who will pledge themselves to the building of canals for their reclamation. Proper restrictions should be made prohibiting the withdrawal of the lands from the market, and the maximum price at which they might be sold should also be fixed. These features, if incorporated in the act, would preclude the possibility of monopolies growing out of the sale of large tracts to one person or company. A much more simple method of bringing these lands into market would be for Congress to make the necessary appropriations for building canals. The lands could then be disposed of to actual settlers under existing laws. If these lands were situated in any one of the States, Congress could easily be prevailed upon to appropriate millions for their reclamation.

I very earnestly suggest that some plan, other than the doubtful expedient of artesian wells, be early adopted for reclaiming and bringing into market the desert lands of the West.

PUBLIC SCHOOLS.

The total number of school children in the Territory between the ages of five and twenty-one years is about six thousand. The annual revenue for school purposes raised by taxes, fines, &c., in the several counties, is about \$25,000.

Under the laws of the Territory each county has the exclusive benefit of its own educational resources and receives no aid from the Territory. The only source of Territorial revenue available for school purposes is the money which might come from escheated estates, which is too small to enter as an item in the account.

The 16th and 36th sections in each township given for school purposes, under the general laws of the United States, are unavailable for the Territories, as by these laws the proceeds of such lands were set apart as an irreducible fund to be kept until the Territory becomes a State. The duty of providing for schools in the Territories has often been urged upon Congress, and bills containing provisions looking to this end have been introduced from time to time, but as yet with no tangible result. As a matter of justice, Congress should give to the Territories portions of the public lands other than the 16th and 36th sections, which are unavailable, or should make appropriations of money for the purpose.

Under present circumstances there is not a county in the Territory that can raise by taxation a sum sufficient to keep up the public schools during the year, and in some of the counties the money from this source is totally inadequate even for a few months in each year.

All the money raised for school purposes is strictly and economically applied to the maintenance of schools in accordance with the laws, no portion of it being allowed to be paid either to the Territorial or county superintendents.

The Territorial controller is *ex officio* superintendent of public instruction, but for this service he is paid nothing, and his sources of information with regard to the condition of the public schools are restricted to the reports of the county auditors, which are generally meager and unsatisfactory, for the reason that these officers all act, so far as schools are concerned, in an *ex officio* capacity, and without pay for this branch of their service. With an appropriation of Congress these defects in the present system could be cured, and, besides promoting the cause of education in the Territories, provision could be made for the collection

of statistics and information concerning schools, a want which at present it is impossible to meet.

CONCLUSION.

In drawing this report to a close I am painfully aware of its imperfections ; still, enough has been stated to show that the affairs of the Territory are in a highly satisfactory condition. Good health has prevailed during the year ; agriculture, stock-raising, and mining have prospered, and all are in a more flourishing condition to-day than ever before. In no material interest has there been any retrograde movement in the Territory.

It is gratifying to note improvement in the public schools. The increased interest manifested by the people in the schools is a sure indication that they are recognized as important factors in building up a community of law-abiding, liberty-loving, intelligent citizens.

The administration of justice has been good, and the interest of the government and Territory cared for with economy and fidelity.

Crime is not more common than in the older communities of the East, and with one exception, infractions of the law meet with as sure and speedy punishment. The one exception noted is the utter failure, or inability, of the officers of the law in two counties of the Territory to punish violations of the anti-polygamy law passed by Congress in 1862. Bear Lake County is populated almost exclusively by Mormons, and in Oneida County this sect claims to have a majority. I am informed that in those counties many persons are living in open, undisguised violation of the anti-polygamy law, and that polygamous marriages are by no means infrequent. Unless it be the intention of Congress to hand over to priestly domination the Territories of Arizona, Idaho, Wyoming, and Utah, with perhaps one or two of the States of the Pacific slope, and permit the setting up in those Territories and States of a system that prevails nowhere else in the civilized world, then the law of 1862 should be amended so as to make it effectual ; otherwise, it should be repealed, and full license given this "peculiar people" to practice their barn-yard system. A residence of some years in Utah has convinced me that kindness and leniency are wasted in dealing with this question, and that the practices in the Territories under the guise of religion which disgrace us as a nation can be eliminated only by adopting the most radical and rigorous measures.

I am indebted to the following gentlemen for valuable information compiled in these pages : Hon. J. B. Miller, Hon. M. Kelly, and Hon. Jos. Perrault, of Boise City ; Hon. T. F. Singiser, of Oxford ; Col. G. L. Shoup, of Salmon City ; Messrs. Colvin and Viar, of Challis ; Hon. A. Walters, superintendent of the assay office, and to Judge W. F. Anderson, of Bonanza City, whose valuable map of Idaho supplies a want long felt.

JNO. B. NEIL,
Governor of Idaho.

Hon. CARL SCHURZ,
Secretary of the Interior.

R E P O R T
OF THE
GOVERNMENT DIRECTORS OF THE UNION PACIFIC
RAILWAY COMPANY.

WASHINGTON, *December 16, 1880.*

Hon. CARL SCHURZ,
Secretary of the Interior:

SIR: The Union Pacific Railroad Company entered into articles of union and consolidation of the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, January 24, 1880.

Since which time a deed of conveyance, as of the same date, has been made by each of the respective companies, to the consolidated company, viz, Union Pacific Railway Company, which has been spread upon its records, and ordered to be sent for registration in the different counties of the States and Territories, in which the real estate of the company is situated.

This deed conveys the entire "lines of railway and telegraph, with all their appurtenances, including right of way, station-houses, rolling stock, and all other property of every kind, connected therewith; also all the lands severally owned by the respective companies, and all that said companies may be entitled to by acts of Congress, or in any other way, intending to convey all lands wherever situated, and all rights of land of whatever kind or nature, legal or equitable, also all property rights, choses in action, and every other matter or thing described in article No. 8 of the articles of union and consolidation; also all other rights, privileges, and franchises, property of every kind, nature, and description."

A copy of the articles of union and consolidation has been filed in your department by the Union Pacific Railway Company, but the government directors, that you may have consecutive information, herewith attach a copy of same to their report.

After the consolidation the question arose as to the jurisdiction of the government directors over the consolidated property, and at a meeting of the board of directors of the Union Pacific Railway Company, held in New York January 26, 1880, the following record was made:

"President Dillon stated that a question had been made as to the legal effect of the consolidation upon the status of the government directors in the new company. He was not prepared to decide this question; the law fixed it one way or the other, and this could not be changed by any action of the company, and he recommended that the question be postponed until the annual meeting, and that meantime our counsel be instructed to give his opinion on the subject. The recommendation of the president was unanimously adopted."

Upon the raising of this question you were communicated with by Government Director Niles, who asked you if you were not entirely clear in your own opinion as to the extended jurisdiction of the government directors over the consolidated company to refer the matters to the Attorney-General, for his opinion, and upon such reference the government directors understood the opinion of the Attorney-General to be favorable as to their extended jurisdiction over the consolidated company.

No official notice was given by the Union Pacific Railway Company to the government directors to attend the meeting of its board, held in New York March 9, 1880; but as that was about the usual time for holding the annual meeting of the board of directors of the Union Pacific Railroad Company, the government directors met by their own appointment on the 8th of March, in the city of New York, and ascertained by telegraphic communication with the railway company's office in Boston no meeting of the board was to be held there, but that a meeting of the Union Pacific Railway Company's board was to be held in New York on the 9th, which meeting the government directors attended, and the following record was made:

President Dillon remarked that he had conferred with the company's counsel in regard to the status of the government directors, and that it had been decided to admit them to the direction of the company under protest, a protest not of hostility, but merely of protection formally expressed, in order that the action of the company might be right in the premises.

Since which time, the government directors have been duly notified to attend the meetings of the board of directors, and no farther question of jurisdiction has been raised, until, in an interview with President Dillon the latter part of July, preparatory to the inspection of the road, transportation was asked for over the consolidated roads, when the jurisdiction of the government directors was again denied and official transportation respectfully refused over any part of the consolidated roads, except the former Union Pacific Railroad, from Omaha to Ogden, thus making an issue with the government that calls for judicial settlement.

This report will therefore be confined principally to the line of railroad from Omaha to Ogden, that being the only part of the line of road the government directors have inspected this year. References will be made to the executive and operative management of the consolidated roads, so far as the government directors have had opportunity of examining same; also to the stock basis upon which the consolidation was made, and all other items of interest that have come under their observation.

The consolidated company is operated in two divisions. The Union Division, comprising the road from Omaha to Ogden, formerly known as the Union Pacific Railroad; and the road from Kansas City to Denver, formerly known as the Kansas Pacific, with the Leavenworth branch, and the road from Cheyenne to Denver, formerly known as the Denver Pacific. The two roads comprising the Kansas Division.

The executive and general operative management of the company comprehends both the Union and Kansas divisions, and is extended over some of the branch lines of railway owned by and in the interest of the consolidated company; the expense of which is distributed on a mileage basis, or on the basis of the earnings of the divisions or branches. This is an equitable distribution. In all other respects the roads are managed as independent lines of railway, each division paying all its obligations incurred in its purchase and use of materials, and in its operation; and the earnings of each division are kept separate.

The branch lines of railroad, aside from the mileage, estimated to them,

in their favor to foster them, of one and a half miles to one mile of the main line of the road, in making up their prorated, of a rate charged, for business given to or received from the main line, are operated and managed as distinct lines of railroad.

This branch system of railways now comprises the—

	Miles.
Omaha and Republican Valley Railroad, length.....	145
Omaha, Niobrara and Black Hills Railroad, length.....	48
Saint Joseph and Western Railroad, length.....	252
Marysville and Blue Valley Railroad, length.....	38
Colorado Central Railroad, length.....	184
Summit County Railroad, length.....	29
Wyandotte and Enterprise spurs, length.....	4
Fort Russell and Almy spurs, length.....	11
Utah and Northern Railway, length.....	304
Carbondale Branch, length.....	32
Junction City and Fort Kearney Railroad, length.....	70
Solomon Brauch Kearney Railroad, length.....	57
Salina and Southwestern Railroad, length.....	36
Denver and Boulder Valley Railroad, length.....	27
Golden, Boulder and Caribou Railroad, length.....	6
Making.....	1,242
Which, with the—	
Union Division.....	1,042
Kansas Division, main line.....	639
Kansas Division, Leavenworth branch.....	34
Kansas Division, Cheyenne branch.....	106

Making together..... 3,084

miles railroad, with the Wyoming, Montana, and Pacific Railway, and the Julesburg line (building), the Utah Central, Utah Southern, and Utah Southern extension; the latter now in operation to Frisco, Utah Territory, 250 miles south of Salt Lake, and their connections, making about 400 miles of additional railroad that is largely owned in the interest of the Union Pacific Railway, and whose traffic largely contributes to increase its earnings.

The Julesburg line is being constructed from Julesburg to strike the Denver Pacific at a point about two miles south of Evans Station, and is being built under the Colorado Central Railroad charter. Fifty-three miles of track have been laid, and owing to the extreme cold weather the work has been suspended for the winter.

Branch lines connecting with the Union Division have been built during the year as follows:

	Miles.
Valparaiso to Lincoln.....	20
Lost Creek to Albion.....	33
Grand Island to Saint Paul.....	24
Echo to Park City.....	29
Extension of Utah and Northern Beaver Cañon to Dillon.....	76

The Burlington and Missouri River Railroad, in Nebraska, have extended their line of road to and across the Union Division at Columbus and Central City.

The Elkhorn Valley Railroad, being built in the interest of the Chicago and Northwestern, is now open, and trains are running to Fremont, a station on the Union Division, 47 miles west of Omaha.

The government directors, with one exception, have gone over the line of the Union Division, and are pleased to note a continued improvement, of the line of road. One hundred and seventy-two miles of steel rails have been laid this year up to October 31, and it is expected that 60 miles in addition will be laid up to January 1, 1881. Four hundred

and eighty-five miles of steel rail were laid previous to that time, in main track, which will make 717 miles of steel track, leaving but 325 miles of steel rail to be laid hereafter to make this division steel rail entire.

Total number of ties put in track from January 1, 1880, to November 1, is 412,350. Of this number 24,580 were cedar, 267,871 were pine, and 119,899 were hard-wood ties, and cost, respectively, delivered on the line of the road, 54, 42, and 75 cents each.

Fourteen spans of iron bridges, from 100 to 150 feet in length, aggregating 1,510 feet, have been built and are in process of erection across Weber River, at or near Croyden, and across Papillion Creek.

No new wooden bridges have been constructed, but all necessary repairs have been made. The road-bed has been raised and widened in many places, and one of the most marked improvements that has yet been made in the property is the change of grade near Elkhorn Station. This grade was something over 80 feet per mile, and by a heavy cut and fill of a mile and a quarter is being cut down to a grade of 21 feet per mile, the work now over two-thirds completed. Over the old grade a freight engine could not haul over 16 to 18 loaded cars, while over the changed grade the same engine can haul 40 loaded cars, with much less wear and tear in the performance of the service, thus demonstrating the desirability of making light grades when they are practicable.

At Laramie Rolling Mills a train of rolls has been added for the manufacture of merchants' bar iron, and machines for making nuts, bolts, spikes, and fish-bars for track work, and almost any other class of iron that may be wanted in the construction of cars, &c.

The water stations have been greatly improved. Nine new frost-proof iron-column water-tanks have been erected at the following stations: Millard, Central City, Wood River, Plumb Creek, Denver Junction, Sidney, Antelope, and Rawlins; and as old tanks may be renewed, or new tanks erected at new stations, similar tanks will be constructed.

The same permanent character of improvement can be noted in the erection of wind-mills, for pumping water, at Millard, Columbus, Central City, Wood River, Plumb Creek, Ogalalla, Denver Junction, Sidney, Antelope, Rawlins, and elsewhere. Cast-iron pits (or sockets) are used as the base, to which, above ground, the timbers are framed, saving the rotting of wood under ground. New wells have been put down, all 12 feet in diameter; at Millard to the depth of 40 feet; Central City, 17 feet; Wood River, 22 feet; Plumb Creek, Denver Junction, Sidney, Echo, and other stations. Other additional improvements have been made to water stations. At Council Bluffs three drive wells have been put down, each 95 feet deep; at North Bend, two drive wells; at Sydney, system of water-works put in, with hydrants, for fire protection; pump and boiler house erected 22 by 30 feet, and steam pump and boiler put in.

At Cooper Lake and Rawlins permanent improvements have been made, and at Echo a new frost-proof tank is in course of construction. Frame pump house 24 by 32 feet, with steam pump and boiler, four hydrants, several thousand feet of iron pipe and suction pipe is used at the different stations for the forcing of water through long distances for the protection of the company's property in case of fire.

Improvements and additions to shops have been made at the following stations: Omaha, brass foundry enlarged, with brick building 14 by 46 feet, and four new brass furnaces put in; addition to iron foundry frame building (detached), 24 by 173 feet. Grand Island, new shops in course of construction; stone building, main building 100 by 150 feet; engine and boiler room, 50 by 50 feet.

North Platte office building, frame, 14 by 20; Echo, frame engine-house, 60 by 75, four stalls; Evanston, frame addition to boiler-shop, 36 by 40; Uintah, frame engine-house, 20 by 60.

Additional machinery has been purchased during the year for shops at Omaha, Grand Island, North Platte, Laramie, Rawlins, and Evanston, consisting of punching-machines, drill-presses, bolt-cutters, wheel-presses, lathes, &c.

The motive power of the Union Division has been largely added to by purchase of new engines and the rebuilding and overhauling of old ones. Nineteen ten-wheel freight engines, 4 mogul switching engines, each 3 pair drivers, 1 single truck, 5 ten-wheel freight engines, purchased but not delivered (were to have been delivered in November); 13 engines have been rebuilt, new and large boilers put in, and new 17-inch cylinders put in place of 16-inch; 11 engines have had new and larger boilers put in; 9 engines have had new 17-inch cylinders put in in place of 16-inch; 40 engines have had general repairs of boilers and machinery; making, in all, 73 engines that have been rebuilt, partially enlarged and renewed, and thoroughly overhauled, thus keeping the motive power of this division up to a high standard. Plans for a new wheel foundry have been made with capacity to make 160 car-wheels a day, and its erection is now being considered.

Coal sheds and shutes have been built at Denver Junction; shed 256 by 35 feet, with inclined track to storage bins; 16 bins, capacity 20 tons each; 32 shutes, capacity 4 tons each. At Echo, coal sheds and shutes of similar capacity. At Plumb Creek, additional shutes have been added to old coal sheds, and a hoisting engine put in to elevate coal from store shed to top of shutes. These improvements, with the coal sheds and shutes at other stations on the line of the Union Division, make large storage capacity for coal and numerous convenient shutes for supplying the locomotives with coal. The car department has been well maintained, and, besides maintaining the cars of the company, has built several new passenger coaches for the main line of this division, and upwards of 175 box, flat, coal, and dump cars, with baggage cars, mail cars, and passenger coaches for branch lines of road.

In the fitting of the passenger cars brass catches are bought by the company and plated. The company does its own nickle and silver plating, upholstering, &c., and as good or a better car of any kind can now be turned out at the shops of the company than can be purchased from a car manufacturer.

Emigrant sleeping cars, for the comfort of emigrant travel, have been introduced on the road; 9 cars have been changed into sleepers, with two tiers of double births on each side of the car, twelve in number, and each car will accommodate 48 persons comfortably. Preference is now given to women and children in their use, and it is the purpose of the company to change their emigrant equipment of 53 cars into sleepers; emigrants furnish their own bedding, and no extra charge is made for use of car.

Cattle yards have been built, during the year, at Alda, Benton, Brady Island, Rock Creek, and Medicine Bow stations. The transportation of cattle this year over the line of road has been less than last on account of the bad condition of feed on the cattle ranges and the lateness of the season at which cattle were fat enough for shipment to market. Also, owing to the early cold weather preventing shipments, several car loads of cattle this year have been shipped from distant stations on the Utah and Northern Road, from which road a large increase in shipments of cattle may be expected, which promises to increase largely the average

length of haul of cattle over the line of road. The prospects for next year's business, from cattle shipments, is said to be better than any past year.

The production of coal shows an increase this year, for the first six months, of upwards of 60,000 tons, and, owing to the early and continued cold weather, promises a larger increase for the last six months of the year, and in consequence of the increased cost of labor will show an increased cost of production.

Production and cost of coal, year ending June 30, 1879, 315,832 tons, cost \$1.02½; year ending June 30, 1880, 393,428 tons, cost \$1.11. Three new coal mines have been opened during the year, none of which are developed far enough yet to give any great increased production. The deposits of coal along and near the line of road are large, and increased business, from coal transportation, can only be measured by the growth of the country. Experiments in coking have been abandoned for the present, as no coal has yet been found on the line of the road that will coke.

Prof. Samuel Aughey has made a very interesting preliminary report on the Wyoming Oil Springs, situate 78 miles north from Point of Rocks Station. Crude petroleum can be obtained there in large quantities that has fine lubricating properties, and from which very superior oil is refined. In time this oil region will afford a large traffic to the road.

The express business of the road is now done by the Pacific Express Company, a company organized by this railway company in connection with a connecting railway company, the stock of the express company being owned by the railway companies, in proportion to the amount of express business that each company may do, this company owning the controlling interest in same.

The land department is offering liberal inducements to emigrants desiring to examine the lands of the company with a view of purchase and settlement. By a general system of advertising at home and abroad, and greatly reduced rates of transportation, the expenses of this department have been increased.

Number of acres sold during the year 1880, 162,018.41, at an average price per acre of \$4.82. This body of land has been sold in small tracts, as the average number of acres to each purchaser is only 92. This promises proper cultivation.

Collections this year will exceed any previous year by \$150,000 to \$200,000. Amount transmitted to the treasurer during the year 1880, \$478,500. Department expenses for the year, \$50,108.60. Sales canceled, 32,478.11 acres.

Terms of consolidation of the Union Pacific, Kansas Pacific with Leavenworth Branch, and the Denver Pacific, as to the respective stock interest of the respective companies, in the consolidated company:

Union Pacific Railroad, stock.....	\$36,762,300
Kansas Pacific Railway Company, stock.....	10,000,000
Denver Pacific Railway and Telegraph Company, stock.....	4,000,000

Making the stock of the consolidated company..... 50,762,300

The Union Pacific Railroad Company created a collateral trust bond, dating from July 1, 1879, to run 29 years from that date, drawing 6 per cent. per annum interest, interest payable semi-annually, making the Union Trust Company of the city of New York trustee. The first mortgage bonds of the Colorado Central Railroad Company, Omaha and Republican Valley Railroad Company, and the Utah and Northern Railway Company, all of which draw 7 per cent. per annum interest, and

are issued respectively for fifteen, ten, and twelve thousand dollars per mile, owned by the Union Pacific Railroad Company, are deposited in this trust. And as said bonds are deposited the Union Trust Company certify and deliver to the railroad company collateral trust bonds for eighty per cent. of the par value of bonds so deposited; the interest upon which is sufficient to pay the interest on the collateral trust bonds, and provide a sinking fund for the gradual redemption of the bonds in trust.

Five million dollars of collateral trust bonds have been delivered to the railroad company, in conformity with the terms of the trust, nearly all of which have been sold; last sales made at \$1.05, and their proceeds have been substantially used to aid in the construction of branch roads, thus enabling the railroad company to retain the securities of its branch roads, and by their deposit, in this or similar trusts, multiply the construction of branch roads, as the mining interests or farther settlement of the country may require. A copy of this trust indenture the government directors attach to this report.

The Union Pacific Railway Company hold large assets, in the securities of the roads it has aided in construction, consisting of first mortgage bonds, and stock, which as the country that is traversed by these branch lines is developed, by the opening of mines or settlement, are constantly increasing in value. The par value of such securities now amounts to fully forty million dollars. A present estimated value of said securities was made by the auditor of the company, July 19, 1880, as being worth \$28,575,651.65, \$6,334,000 of which have been put into the collateral trust bond trust.

The estimated gross earnings of the Union Pacific Railway, for the current year, nearly eleven months of which have transpired, and branch lines of railroad are.....	\$25, 000, 000
Of which the branch lines will earn about.....	2, 500, 000
Leaving	22, 500, 000

The Union Division will probably earn of this amount \$15,750,000; the Kansas Division \$6,750,000. This would show that the Union Division earns 70 per cent. of the gross earnings, and the Kansas Division 30 per cent., showing an increase of gross earnings this year, compared with last, on the Union Division of \$2,549,000, and a larger proportionate increase of gross earnings on the Kansas Division. This can be accounted for by the consolidation. The business of the whole Southwest, as well as that from lake points, Central Indiana, Illinois, Ohio, and a fair proportion of through business, for which the separate roads competed before the consolidation, has gone into its natural channel of transportation; while formerly all of this business that the Union Pacific Railroad could control, as well as the roads terminating at Council Bluffs and Omaha, went to those respective points for distribution.

The operating expenses for the current year on the Union Division will be about 44 per cent. of its gross earnings, including renewals and taxes. On the Kansas Division about 50 per cent., including renewals and taxes.

The expenses of the general offices in New York and Boston are apportioned to consolidated roads on a mileage basis.

The Pullman sleeping-car contract will expire next year, and, unless a new contract can be made on a liberal basis, in which the railway company will be largely interested in the revenue received for the use of the cars, before the expiration of the contract, the railway company will consider and determine the question of running its own sleeping-cars.

The directors are informed that substantially the same pooling arrangements exist this year as last. At competitive points, with competitive roads, the business is pooled, the road performing the service deducting 40 per cent. for operating expenses, and the balance is divided on an agreed percentage basis.

A contract for five years with the Atlantic and Pacific Steamship Company has been prepared, in which the Central Pacific Railroad Company is a party, and authority has been given for its execution, the terms of which govern in settlements between the steamship company and the railway companies; but the same has not yet been executed.

The same policy of the improvement of the property is manifest for the coming year as has been shown for the past two years. Contracts have already been made for 35,000 tons 60-pound steel rails, 5,000 tons 40-pound rails for the Utah and Northern, 12 first-class passenger coaches, 5 first-class narrow-gauge coaches, 500 box-cars, 300 cattle-cars, 18 ten-wheeler Taunton engines, 15 consolidated fifty-ton engines (17 more engines are being negotiated for, making 50 engines of this class), and 25 narrow-gauge engines have been contracted, for the Utah and Northern, deliveries of which are to be made at stated periods during the year 1881; and orders have been given for two Pullman narrow-gauge sleepers, and at the shops of the company to build for the Utah and Northern Road 2 mail and express cars, 50 box, and 25 cattle cars.

It is now expected that the Atchison, Topeka and Santa Fé Railroad will be completed to a connection with the Southern Pacific Railroad of California, in New Mexico, by the first of January. This will make a competing line of railway through to California, about 400 miles longer than via the Union Pacific and Central Pacific Railways to San Francisco. In passenger travel, eighteen hours additional time will be required to make the trip to San Francisco, and thirty-three hours additional time for freight transportation. Hence, as quick transit, particularly on long routes of travel, is very desirable and generally sought for, the Union and Central Pacific Railway route will doubtless remain the favorite route for passenger travel and freight traffic. The government directors are informed that a satisfactory business arrangement will be made with this competing line of railway, and thus avoid undue competition for business.

The policy of building and aiding to build branch lines of railroad by this company, that has been pursued in past years and is still being continued, was wise, both in its conception and in its execution, as the trunk line of railway has branch and feeding lines of railway to support it, independent of its through business, which now amounts to but a small proportion of its traffic, viz, 28 per cent.

The tabular statement attached will show the number of through cars of freight hauled on the Union Pacific Railway between Omaha and Ogden, for through California business, in the months of August, September, October, and November, 1879 and 1880. Average daily for 1879, twenty-eight cars per day each way; for 1880, thirty-three cars per day each way. And any loss of through business in the year 1881 there may be, in consequence of division with the Atchison, Topeka and Santa Fé Railroad, will, in the opinion of the government directors, be more than made up in the increased business that will be derived from its branch lines of road and its local business.

Consolidation is now becoming a great feature in the railway management of this country. It tends towards economy, and greatly facilitates travel and freight traffic. The internal commerce of the country is demanding quick transit, and equalized and uniform rates of trans-

portation. Consolidation will give the former, as through trains of freight can be made up over consolidated roads for given points, and the delay and loss of time can thus be avoided that occurs, where trains are made up containing cars for different localities, in switching.

The latter by liberal railway management.

The present combination and pooling system of railway management prevents undue competition, and it is claimed, as pools are made up on the basis of earnings, through, to, or from a given competing point or points, or supposed earnings of the competing lines.

Shippers of property are not imposed upon, but uniform and equalized rates of transportation are fixed and maintained.

With the large productions of the country for the past two years, the ready and satisfactory market for their sale, both at home and abroad, with the ability of the rolling stock of the railways of the country, at times taxed to its utmost capacity, to move the products of the country to market and to the seaboard ports for export.

This theory is becoming an accepted one. The time for its test will come when the productions of foreign consuming countries are large, and our own products, by similar productions and limited export demand, begin to accumulate in the granaries of our agriculturists and elevators and warehouses at our marts of commerce, and consequent low prices for same prevail; for then lower rates of transportation will be demanded than now prevail.

Consolidation with the Central and Southern Pacific Railways has been informally considered, relative to which no satisfactory conclusion has yet been reached, upon an equitable basis, both for the interest of the government and the respective railways it would be desirable.

GEO. B. SMYTH,
R. P. BUCKLAND,
C. C. HOUSEL,
JUDSON KILPATRICK,
Government Directors.

Statement showing the number of cars hauled on Union Pacific Railway between Omaha and Ogden for through California business.

1879.

	August.	September.	October.	November.	Total.
East bound	650	633	987	856	3,126
Daily average	21	21	32	28	25
West bound	901	831	919	953	3,604
Daily average	29	28	29	32	29
Total east and west bound	1,551	1,464	1,906	1,809	6,730
Total daily average (say 28 cars per day each way)	50	49	61	60	55

1880.

	August.	September.	October.	November.	Total.
East bound	488	804	988	1,162	3,442
Daily average	16	27	32	39	30
West bound	1,019	1,022	1,289	1,261	4,591
Daily average	33	34	42	42	37
Total east and west bound	1,507	1,826	2,277	2,423	8,033
Total daily averages (say 33 cars per day each way)	49	61	74	81	67

THE UNION PACIFIC RAILROAD COMPANY TO THE UNION TRUST COMPANY OF NEW YORK, TRUSTEE.

Collateral trust indenture, July 1, 1879.

Indenture made and executed by and between the Union Pacific Railroad Company and the Union Trust Company of New York, this first day of July, 1879.

1. The Union Pacific Railroad Company holds fourteen hundred of the bonds of the Colorado Central Railroad Company, each for the sum of \$1,000, dated July 1, 1879, payable in thirty years from said date, and bearing interest at the rate of 7 per cent. per annum, secured by mortgage of the same date of the road and franchises of said company, the aggregate amount of all the bonds secured by said mortgage being \$2,526,000, or at the rate of \$15,000 per mile for each mile of said road; and said Union Pacific Railroad Company may hereafter become possessed of the whole or a part of the remainder of said bonds.

It holds, also, eight hundred and forty of the bonds of the Omaha and Republican Valley Railroad Company, each for the sum of \$1,000, dated July 1, 1879, payable in thirty years from said date, bearing interest at the rate of 7 per cent. per annum, secured by a mortgage of the same date of the road and franchises of said company, the aggregate amount of all the bonds issued and to be issued under said mortgage being at the rate of \$10,000 per mile for each mile of said road; and said Union Pacific Railroad Company may hereafter become possessed of the whole or part of the remainder of said bonds thus issued or to be issued under said mortgage.

Said Union Pacific Railroad Company also holds fifteen hundred and ninety-four of the bonds of the Utah and Northern Railway Company, each for the sum of \$1,000, dated July 1, 1878, payable in thirty years from said date, bearing interest at the rate of 7 per cent. per annum, secured by mortgage of the same date of the road and franchises of said company; and it may hereafter become possessed of other of said bonds issued or to be issued as the construction of said road progresses. By an act of Congress, the issue of said mortgage bonds is limited to \$15,000 per mile of said road; but the issue heretofore made, and to be hereafter made, is, and is to be, limited to the rate of \$12,000 per mile.

2. Said Union Pacific Railroad Company proposes to issue from time to time its bonds, dated July 1, 1879, each for the sum \$1,000, payable in twenty-nine years from said date (unless paid sooner by the sinking fund in the manner herein set forth), bearing interest payable semi-annually at the rate of 6 per cent. per annum, both principal and interest payable in gold coin of the United States, and to secure the payment of the same by a deposit with said trust company, upon the trusts and in the manner hereinafter stated, of the bonds of said Colorado Central Railroad Company, said Omaha and Republican Valley Railroad Company, and said Utah and

Northern Railway Company, secured by said respective mortgages, and now held or that may hereafter be acquired and held by said Union Pacific Railroad Company, 80 per cent. of the par value of the bonds thus deposited to be equal in amount to the par value of the 6 per cent. bonds thus to be issued by said Union Pacific Railroad Company.

3. The times and manner in which said deposit in trust shall be made, held, and executed, to be as follows: Upon the deposit, from time to time, of any part of said bonds, said trust company is to certify the said 6 per cent. bonds of the Union Pacific Railroad Company to an amount equal to 80 per cent. of the par value of the bonds thus deposited, and deliver the same to said corporation, which certificate shall declare that the bonds thus certified and the holders thereof are entitled to all the benefits of said trust, and comprehended in all its provisions, and that no bonds not thus certified shall be so embraced or in any manner participate in the trust or security hereby created. All said bonds thus deposited in trust, from time to time, shall, irrespective of the date of such deposit, stand and be held as a common security, as well for said 6 per cent. bonds then and theretofore issued and certified as for those that may thereafter be issued and certified in conformity to the provisions of this instrument. This provision shall not be construed as conflicting with provisions hereinafter stated as to the disposition of said bonds.

4. The interest of the said bonds of the said Union Pacific Railroad Company is to be made payable semi-annually to the holders thereof at the office of said company in the city of Boston, or its agency in the city of New York.

5. Said Union Pacific Railroad Company shall provide for the payment of interest on its said 6 per cent. bonds by a deposit with the said trust company, from time to time, on or before the successive maturities of its coupons, of a sum equal to the amount of the coupons on the bonds of said Colorado Central and said Omaha and Republican Valley Railroad Companies, and said Utah and Northern Railway Company, thus deposited, maturing at the same dates, which amount shall be applied by said trust company, as agent of said Union Pacific Railroad Company, so far as the same is necessary, to the payment of the coupons of said 6 per cent. bonds; and the difference between the coupon interest of said 6 per cent. bonds and the coupon interest upon all the bonds thus held in trust shall be held by said trust company in trust for the purposes and in the manner hereinafter set forth; and said trust company shall collect the coupon interest upon all said bonds thus held in trust, and pay over the same, as received, to the said Union Pacific Railroad Company, and deliver to said last-named company the coupons upon its said 6 per cent. bonds thus paid by it.

6. Said difference is to be retained in deposit with said trust company upon the terms of its other deposits, until the same shall amount to the sum of not less than \$10,000, and as it shall reach that sum or more, from time to time, be invested by said trust company, with the accumulated interest, in said 6 per cent. bonds of the Union Pacific Railroad Company, at a price not exceeding par value with 5 per cent., premium and accrued interest, and all bonds so redeemed are to be canceled and delivered to the said Union Pacific Railroad Company, and said trust company is also to surrender to the said Union Pacific Railroad Company, from out the bonds thus held in trust as security, bonds, which at their par value shall exceed as near as may be, by 25 per cent., the par value of the 6 per cent. bonds thus paid and canceled, the same to be taken, as far as possible, in equal proportion from each class of said bonds.

7. Said trust company is to give public notice in one or more newspapers published in Boston and New York of its readiness to purchase said bonds, and in case the same cannot be purchased in response to such advertisement at not exceeding 5 per cent., premium and accrued interest, then the said trust company is, in a fair and just manner, in the presence of a notary public, to designate by lot the bonds, to the purchase of which, at 5 per cent., premium and interest, said fund is to be applied, and to give notice of such designation by publication of the numbers of each of said bonds in some newspaper published in the cities of Boston and New York, once a week for three weeks successively, and fixing the date and place where such bonds will be thus paid at 5 per cent., premium and interest, up to the date of such designated period, and from and after that period interest upon such bonds shall no longer be payable by said company. The cost of advertising, stamps, and all other expenses (except the services of said trust company) necessary to carry this agreement into effect, to be paid by the said Union Pacific Railroad Company.

8. Any holder of said 6 per cent. bonds, excepting those designated by lot and notice given as aforesaid, amounting at par to not less than \$5,000, secured by this agreement, shall be at liberty on thirty days' notice in writing to said company, and also to said trust company, to surrender the same to said trust company, and receive in exchange therefor from out the bonds at the time of such notice held in trust and as security, bonds at par equal in number to the number of bonds thus surrendered, such bonds to be taken, as near as may be, from each class of said bonds in the proportion that each class bears to the aggregate of all the classes of bonds then held, and in case of such surrender said trust company shall cancel the 6 per cent. bonds

thus surrendered and deliver the same to said Union Pacific Railroad Company, and shall also restore to said company for its own use the surplus of bonds held by it in trust as security for the payment of said 6 per cent. bonds thus surrendered and exchanged, such surplus to be taken, as near as may be, from each class of said bonds in the manner and proportion above stated.

9. No responsibility shall attach to said trust company in regard to the final redemption of either of said classes of said bonds or the interest thereof, other than as funds are provided therefor.

The trustee shall be entitled to compensation as follows, viz:

For countersigning bonds, \$1 per \$1,000.

Receiving and holding in trust, 15 cents per \$1,000, and $\frac{1}{8}$ of one per cent. on par value of coupons cut off and collected half-yearly.

Administering sinking fund, $\frac{1}{4}$ of one per cent. upon amount of sinking fund passing through hands of trustee.

Interest upon funds paid in to be allowed at the trust company's usual rate on deposits at interest, but interest to cease at maturity of coupons on amount required to pay all coupons of that date, which amount shall be transferred to credit of coupon account, and such cessation of interest shall be in lieu of compensation for payment of coupons. For all services not enumerated above the trustee shall be entitled to reasonable compensation.

10. In case said Union Pacific Railroad Company shall fail to make said deposit with said trust company of a sum equal to the amount of the coupons of the said Colorado Central and said Omaha and Republican Valley Railroad Companies and said Utah and Northern Railway Company, at the times and in the manner hereinbefore set forth, then, upon the request of the holders of said 6 per cent. bonds to an amount equal to 25 per cent. of the bonds then outstanding, the said trust company shall sell at public auction such portion of the bonds of said Colorado Central and said Omaha and Republican Valley Railroad Companies and said Utah and Northern Railway Company, or other securities which it may so have in its possession for said trust, as may be necessary to pay the amount of principal and interest of all the said 6 per cent. bonds of the said Union Pacific Railroad Company remaining unpaid, whether due or otherwise; and if the proceeds of said sale shall be insufficient for that purpose, shall distribute the same pro rata, and, after payment of all said bonds and interest from the proceeds of said sale, shall surrender the surplus, if any, with the remainder of the bonds and securities, to the said Union Pacific Railroad Company; and in case the said Union Pacific Railroad Company shall fail to pay the principal of its said bonds at maturity, said trust company is in like manner to sell and dispose of said bonds and securities thus held in trust, apply the proceeds to the payment of said bonds and interest of the said Union Pacific Railroad Company, and surrender the surplus and the remainder of the bonds and securities, if any, to the said Union Pacific Railroad Company.

11. In case of default of said Colorado Central Railroad Company, said Omaha and Republican Valley Railroad Company, or said Utah and Northern Railway Company, or either of them, in the payment of either the principal or interest of their said bonds, or any part thereof, then said trust company may, thereupon, if the said Union Pacific Railroad Company, by vote of its directors, shall request it so to do, instead of enforcing said bonds by foreclosure or otherwise, deliver the whole of the same upon which such default has occurred to said Union Pacific Railroad Company, upon receiving from it other equivalent securities to the satisfaction of said trust company, for the payment of its bonds and interest, which securities are to be held and administered by said trust company in the same manner and upon the same trust as those upon which it held the bonds so delivered; but in case no such request shall be made, or if for any reason the said trust company shall elect not to deliver said bonds thus in default to said Union Pacific Railroad Company, and take security therefor as above provided, then the said trust company is to proceed to foreclose the mortgage, the payment of the bonds secured by which is thus in default, and apply and distribute the proceeds of the foreclosure sale, after deducting all charges and expenditures attending such foreclosure sale, and their own reasonable compensation connected therewith, in the manner following, that is to say:

If said net proceeds shall be in amount sufficient to pay all of said 6 per cent. bonds then outstanding, with the interest due thereon, and a premium of 5 per cent. or less upon the principal of said bonds, then said trust company shall advertise in one or more newspapers published in the cities of Boston and New York twice a week for six weeks successively, fixing a period not exceeding ten days from the last publication of such notice, on or before which it will take up and cancel said 6 per cent. bonds, paying therefor the principal and interest, and such premium upon said bonds, not exceeding 5 per cent., as the net proceeds of said foreclosure sale will permit; and if, at the expiration of the period thus fixed, all the holders of said 6 per cent. bonds shall not have surrendered the same and received payment therefor as aforesaid, the remainder of the proceeds of such foreclosure sale not thus applied to the payment of said bonds shall be paid over to the said Union Pacific Railroad Company for its own use.

If the proceeds of such foreclosure sale shall be only sufficient or less than sufficient to pay said 6 per cent. bonds and interest thereon, then said trust company is to advertise, in manner as aforesaid, for proposals from the holders of said 6 per cent. bonds to sell to said trust company their said bonds at a rate not exceeding the face thereof, with interest and a premium of 2½ per cent. upon said bonds, and said net proceeds shall be applied to the purchase and cancellation of the same from parties making the lowest offer; and if in answer to such proposals the said net proceeds shall not be exhausted, the surplus, if any, shall be paid over to the said Union Pacific Railroad Company for its own use.

12. For all services in the execution of this trust said trust company shall receive compensation as aforesaid, to be paid out of the proceeds of the trust fund before any payments are made for or on account of interest or principal of said bonds.

It is understood and agreed that upon the payment of principal and interest and cancellation of said Union Pacific Railroad Company's six per cent. bonds certified under this agreement, and upon the payment to the trust company of all the expenses of this trust, as agreed upon, the remaining bonds, securities, and cash, if any, shall be paid over to the said Union Pacific Railroad Company.

In testimony whereof the said Union Pacific Railroad Company and the said Union Trust Company, of New York, have caused their corporate seals to be affixed hereto, and these presents to be signed by their respective presidents, the day and year first above written. This indenture is executed in triplicate to serve as one.

[SEAL OF THE UNION
PACIFIC RAILROAD CO.]

THE UNION PACIFIC RAILROAD COMPANY,
By SIDNEY DILLON, *President*.

Attest:

HENRY MCFARLAND, *Secretary*.

[SEAL OF THE UNION
TRUST CO.]

THE UNION TRUST COMPANY OF NEW YORK,
By EDWARD KING, *President*.

Attest:

A. O. RONALDSON, *Secretary*.

[Form of bond.]

UNITED STATES OF AMERICA.

THE UNION PACIFIC RAILROAD COMPANY.

Collateral trust bond.

The Union Pacific Railroad Company acknowledges itself indebted to the bearer hereof in the sum of \$1,000, which sum said company promises to pay to the bearer, or, in case of registration, to the registered holder hereof, twenty-nine years after date, at its office in the city of Boston, and also interest thereon at the rate of six per cent. per annum, payable semi-annually on the first day of each January and July ensuing the date hereof, until said principal sum shall be paid, on presentation of the annexed coupons at the office of the company in Boston, or at its agency in the city of New York, both principal and interest being payable in gold coin of the United States.

This bond is secured by a deposit in trust of the mortgage bonds of the Colorado Central Railroad Company, the Utah and Northern Railway Company, and the Omaha and Republican Valley Railroad Company, with the Union Trust Company of New York, under an indenture between the said Union Pacific Railroad Company and the said Union Trust Company, bearing date July 1, 1879, and is subject to redemption by the Union Pacific Railroad Company, on the payment of the principal and accrued interest, together with a premium of 5 per cent., after notice, and at the times and in the manner set forth in said indenture.

This bond shall pass by delivery unless registered, or, if registered, by transfer on the books of said company at its office in Boston, and at such other places as its directors may appoint. After registration of ownership, certified hereon by the transfer agent of the company (unless the last transfer shall have been to bearer), no transfer shall be valid unless made on the books of the company by the registered owner in person, or by attorney, and recorded hereon by said transfer agent.

In testimony whereof the said Union Pacific Railroad Company has caused its corporate seal to be hereto affixed, and this bond to be signed by its president, and countersigned by its treasurer, this first day of July, 1879.

[L. S.]

THE UNION PACIFIC RAILROAD CO.,
By SIDNEY DILLON, *President*.

Countersigned:

HENRY MCFARLAND, *Treasurer*.

[Back of bond.]

No. —.

THE UNION PACIFIC RAILROAD COMPANY.

COLLATERAL TRUST BOND.

SIX PER CENT.

(\$1,000.)

Interest payable January 1 and July 1. Principal due July 1, 1908. Gold.

Bondholders are cautioned that anything written or stamped upon this bond, except by an officer of the company in conformity to its terms, injures its value for sale and delivery.

No provision is made for the registration of the coupons of this bond.

[Form of coupon.]

On the first day of January, 1880, The Union Pacific Railroad Company will pay to the bearer at its office in Boston, or its agency in New York, thirty dollars in gold coin of the United States, being for six months' interest on bond No. —.

\$30.

Treasurer.

(On the margin :) 1.

Form of Trustee's certificate.

The undersigned, the Union Trust Company of New York, doth hereby certify that this bond is one of a series issued in conformity to an indenture of trust executed between it and the Union Pacific Railroad Company, bearing date July 1, 1879, and is entitled to all the benefits of said trust, and comprehended in all its provisions.

THE UNION TRUST COMPANY OF NEW YORK, *Trustee.*
By EDWARD KING, *President.*

Articles of union and consolidation between the Union Pacific Railroad Company, the Kansas Pacific Railway Company, and the Denver Pacific Railway and Telegraph Company, forming the Union Pacific Railway Company.

ARTICLES OF UNION AND CONSOLIDATION.

Whereas the Union Pacific Railroad Company, a corporation duly organized and existing under the act of Congress of July 1, 1862, entitled an act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the government the use of the same for postal, military, and other purposes," and the act of Congress of July 2, 1864, and various other acts amendatory of the foregoing, owns a line of railroad and telegraph extending from the Missouri River to Ogden, in the Territory of Utah, a distance of 1,042 miles; and

Whereas the Kansas Pacific Railway Company, described in the said act of Congress of July 1, 1862, as the Leavenworth, Pawnee, and Western Railroad Company, the name whereof was afterwards changed to that of the Union Pacific Railroad Company, eastern division, and again subsequently changed to the Kansas Pacific Railway Company, is a corporation which is entitled to participate in the benefits of the said act of Congress of July 1, 1862, and of July 2, 1864, and the various acts amendatory thereof and relating thereto; and

Whereas the said Kansas Pacific Railway Company owns and operates as a branch of the Union Pacific Railroad a railroad and telegraph line from a point connecting with the Missouri Pacific Railroad in Kansas City, in Missouri, thence from the Missouri River at the mouth of the Kansas River, on the south side thereof, with a spur from Wyandotte, in the State of Kansas, being from the east State line of Kansas to Denver, 639 miles in length, with a branch from a point on the main line near Lawrence to Leavenworth, 34 miles in length, in said State of Kansas, connecting at Denver with the Denver Pacific Railway, and is entitled to extend said railroad to the western boundary of the former Territory of Kansas, to locate and construct branches of said railroad in the counties of the former Territory of Kansas adjacent to the line of said railroad, as then located and defined by law; and

Whereas the Denver Pacific Railway and Telegraph Company, under and by virtue of the said acts of Congress, and of an act of Congress approved March 3, 1869, entitled "an act to authorize the transfer of lands granted to the Union Pacific Railway Company, eastern division, between Denver and the point of connection with the Union Pacific Railroad, to the Denver Pacific Railway and Telegraph Company, and to expedite the completion of railroads to Denver, in the Territory of Colorado," and of an act of Congress approved June 20, 1874, which, among other things, enacts that for all the purposes of the said act of July 1, 1862, and of the acts amendatory thereof, "The Denver and Pacific Railway and Telegraph Company shall be deemed and taken to be a part and extension of the road of the Kansas Pacific Railroad to

the point of junction thereof with the road of the Union Pacific Railroad Company at Cheyenne, as provided in the act of March 3, 1859," whereby, and by force whereof, the said Denver Pacific Railway and Telegraph Company is likewise entitled to participate in the benefits of the aforementioned acts of Congress of July 1, 1862, and July 2, 1864, and the various acts amendatory thereof and supplemental thereto, and relating to the Pacific system of railroads, all of which, whether particularly herein described or not, are, for greater certainty in this behalf, referred to and made part hereof; and

Whereas the said Denver Pacific Railway and Telegraph Company owns a line of road one hundred and six miles in length, extending from Denver, where it connects with the said Kansas Pacific Railway, to Cheyenne, where it connects with the Union Pacific Railroad; and

Whereas, in the aforesaid legislation of Congress, applicable to the above-mentioned three railroad companies, it is provided that they may unite and consolidate their respective organizations; and

Whereas each of the said above-mentioned three companies, by corporate action duly and severally had, have resolved, pursuant to the authority in that behalf vested in them by law, to unite and consolidate their respective organizations into one company, and have severally agreed to and with each upon the terms of such union and consolidation, being the terms herein embodied and expressed:

Now, this agreement of union and consolidation, made this, the 24th day of January, A. D. 1880, between the said Union Pacific Railroad Company, party of the first part, the said Kansas Pacific Railway Company, party of the second part, and the said Denver Pacific Railway and Telegraph Company, party of the third part, witnesseth:

That the said parties have respectively agreed, and do hereby severally agree to and with each other, upon the following articles of union and consolidation of their respective organizations into one company, viz:

ARTICLE I. The said Union Pacific Railroad Company, the said Kansas Pacific Railway Company, and the said Denver Pacific Railway and Telegraph Company, in consideration of the premises, do hereby severally agree to and with each other to unite and consolidate, and do hereby unite, form, and consolidate their respective organizations, properties and companies into one consolidated company, which shall succeed to, possess, and be entitled to receive from the Government of the United States all and singular the grants, benefits, immunities, guaranties, acts, and things to be done and performed, and be subject to the same terms, conditions, restrictions, and requirements which the aforesaid three companies respectively, at the date of this consolidation, are, or may be, entitled or subject to under the acts of Congress in that behalf, in place and substitution of said constituent companies, so consolidated, respectively; and the said consolidated company assumes to and for itself all of the provisions of said acts of Congress, so far as applicable, relating or in any manner appertaining to said constituent companies or either of them, including the power to sue and be sued in all courts of law and equity within the United States, whether Federal or State, and the right of corporations organized under a law of the United States to remove causes from State to Federal courts; and all of the provisions of the aforementioned acts of Congress, and each of them, so far as in their nature applicable to the company hereby formed, shall apply thereto, it being the intent of the parties hereto and of these articles of union and consolidation to organize the company hereby formed under the said acts of Congress and to make the said acts of Congress the charter or constituent acts of this company as fully as if the same were incorporated herein at large.

ART. II. The name of the consolidated company hereby formed shall be the Union Pacific Railway Company.

ART. III. The capital stock of the said Union Pacific Railway Company shall be \$50,762,300 (being the total aggregate amount of the outstanding stock of the three constituent companies), which shall be divided into shares of one hundred dollars each, and it shall be issued in lieu of the stock of the said constituent companies on the surrender thereof, for that purpose, by the respective holders thereof. Every stockholder in the Denver Pacific Railway and Telegraph Company and in the Union Pacific Railroad Company shall receive in place of every share of one hundred dollars surrendered a share of \$100 in the new company, and every stockholder in the Kansas Pacific Railway Company, the shares in which are only \$50 each, shall receive, in place of every two shares of the stock at the time held by such stockholder in such company, a share of the capital stock of the new corporation upon surrendering to the new corporation the certificates of stock held by such stockholder.

ART. IV. The said new corporation shall, without unnecessary delay, issue certificates of stock, in such form as may by the board of directors be deemed advisable, and such board shall provide and adopt such rules and regulations as may be necessary and proper for the issuing and transfer of shares of stock of the said new corporation.

ART. V. The directors of the said Union Pacific Railway Company, to be elected by

the stockholders at the annual meetings herein provided for, shall be fifteen in number, each of whom must be the *bona fide* owner of at least fifty shares of stock in the consolidated company. Such directors shall be chosen annually by a majority of the votes of the stockholders voting in person or by proxy at such election. And they shall continue to be directors until others are elected and qualified in their places. No person shall be a director unless he shall be qualified to vote for directors at the election at which he shall be chosen; and vacancies in the board of directors may be filled by the remaining directors at any regular meeting of the board.

The directors of said company shall, annually, as soon as may be after their election, elect from their own number a president and vice-president, and shall also elect a treasurer and secretary.

ART. VI. The following-named persons shall be the first directors of said corporation, viz: Fred. L. Ames, Ezra H. Baker, Elisha Atkins, F. Gordon Dexter, Sidney Dillon, Russell Sage, Jay Gould, Solon Humphreys, David Dows, William L. Scott, Silas H. H. Clark, Thomas T. Eckert, John Sharp, Grenville M. Dodge, Carlos S. Greeley. The following-named persons shall be the first officers of the said corporation, viz: president, Sydney Dillon; vice-president, Elisha Atkins; treasurer and secretary, Henry McFarland. The said directors and officers shall continue in office until their successors are chosen, as provided in these articles.

ART. VII. Until otherwise duly provided, the annual meetings of the stockholders of the Union Pacific Railway Company shall be held at the company's office, in the city of New York, on the first Wednesday following the 4th day of March in each year, between the hours of 10 o'clock a. m. and 4 o'clock p. m. of said day. Notice of such meeting shall be given as may be prescribed by the by-laws. These provisions may be changed by the stockholders of consolidated company at any annual meeting of the said stockholders.

ART. VIII. The parties hereto of the first and second and third parts hereby assign, transfer, set over and convey unto the said Union Pacific Railway Company, the consolidated corporation hereby formed, all the rights, privileges, exemptions and franchises of each of said companies parties hereto, and all the property, real, personal, and mixed, and all choses in action, debts, on whatever account, of, owing, or belonging to either of said companies, and all claims, demands, property, rights of way, leases, leasehold interests, branches, iron rails, rolling stock, tools and implements, and property of every description, name, and nature, belonging to either of the said companies, with the appurtenances, to be held, owned, and controlled by the said consolidated corporation, its successors and assigns, as fully and completely, to all intents and purposes, as the respective parties thereto do or can now own, hold, use, enjoy or control the same; and the parties hereto agree to execute and deliver to said consolidated corporation instruments of transfer or assignments, or other instruments proper or necessary to carry out the covenants, conditions, and provisions of this agreement. This assignment, transfer, sale and conveyance is made to the said consolidated corporation subject to all liens, charges, and equities pertaining thereto.

ART. IX. Nothing in this agreement contained shall affect or prejudice any rights otherwise existing of the consolidated company to make such further increase of stock or bonds as said consolidated company may by law be entitled to make, or restrict the amount of stock or bonds which such consolidated company is by law authorized to issue or make. Nor shall anything herein contained affect or impair the right to issue all unissued bonds under the Kansas Pacific consolidated mortgage of date May 1, 1879, wherein Jay Gould and Russell Sage are trustees, but such unissued bonds may, notwithstanding this consolidation, be issued in the same manner and with the same effect in all respects as if these articles had not been adopted and executed. And it is expressly agreed that the stockholders of the consolidated company shall have all the powers which would have been possessed by the stockholders of each constituent company if this consolidation had not been effected, to ratify, approve, and carry out any contracts made by either constituent company, and requiring the ratification or approval of its stockholders. The power of the Union Pacific Railroad Company to issue all unissued bonds under the mortgage of July 1, 1879, wherein the Union Trust Company is trustee, is fully and completely reserved.

ART. X. The new company hereby formed does not herein assume any separate or individual liability for the outstanding debts, obligations, and liabilities of the respective constituent companies, whose several and separate existence as to third parties shall as respects such debts, obligations, and liabilities of every kind and nature still continue, notwithstanding these articles of union and consolidation. But nothing herein contained shall prevent any valid debt, obligation, or liability of either constituent company from being enforced against the property of the proper constituent company, which by force of these articles becomes the property of the consolidated company. The corporate existence of the respective constituent companies shall not absolutely cease *eo instanti*, on the consummation of the union and consolidation herein provided for, but shall remain and continue so far as necessary to carry out the intent and purpose thereof.

ART. XI. These articles of consolidation shall go into effect, and the consolidated company hereby formed shall come into existence, upon the day on which a copy hereof is filed in the Department of the Interior, as provided in the legislation of Congress in that behalf.

ART. XII. The existing by-laws of the Union Pacific Railroad Company are hereby provisionally adopted and shall apply to the company hereby formed, until duly changed or repealed.

ART. XIII. All books, vouchers, records, instruments of title, cash, evidences of debt, contracts and documents pertaining to the business or property of the said three companies, parties hereto, shall, without delay, be delivered to the proper officers of the consolidated company, and the said books, records, and papers shall be deemed and taken, as far as necessary, as the records and books of said consolidated company; and said books, records, vouchers, and papers shall be subject to the proper examination and inspection of all persons interested therein.

ART. XIV. These articles may be amended and modified, from time to time, and in such manner as the holders of two-thirds of the stock of the consolidated company may direct or approve.

ART. XV. This agreement shall be executed on the part of the respective parties hereto, by the proper officers, and under the corporate seals of said companies.

In witness whereof, the said parties have caused their respective corporate seals to be hereunto affixed, and the same to be attested by their respective presidents and secretaries, this the twenty-fourth day of January, 1880.

[SEAL.]

Attest:

[SEAL.] HENRY MCFARLAND,

Secretary.

THE KANSAS PACIFIC RAILWAY COMPANY,

By SIDNEY DILLON, *President.*

[SEAL.]

Attest:

[SEAL.] A. H. CALEF,

Secretary.

THE DENVER PACIFIC RAILWAY AND TELEGRAPH COMPANY,

By D. M. EDGERTON, *President.*

[SEAL.]

Attest:

[SEAL.] D. H. MOFFATT, Jr.,

Acting Secretary.

The Union Pacific Railway Company has signified and hereby signifies its assent to and acceptance of the foregoing articles of union and consolidation, January 24, 1880.

THE UNION PACIFIC RAILWAY COMPANY,

By SIDNEY DILLON, *President.*

[SEAL.]





g. Devil's Thumb. h. Hot Spring Terraces. i. Barn. n. Corral

PARK. WY. TER.

j. Blacksmith Shop m. Reservoir



ANNUAL REPORT

OF THE

SUPERINTENDENT OF THE YELLOWSTONE NATIONAL PARK.

HEADQUARTERS MAMMOTH HOT SPRINGS,
YELLOWSTONE NATIONAL PARK, WYOMING,
November 30, 1880.

Hon. CARL SCHURZ,
Secretary of the Interior :

SIR: I have the honor to submit the following report of operations during the year 1880 for the preservation, protection, and improvement of the Yellowstone National Park (the fourth which I have submitted to the department), and to respectfully request that if approved it may be printed.

Soon after the negotiation in Washington of treaties with the Crow, Shoshone, Bannack, and Sheepstealer Indians, who had been either aboriginal owners of, or occasional troublesome ramblers in portions of the Park, I proceeded, via Omaha and Ogden, to the agency of a part of the Shoshone and all the Bannock and Sheepstealer Indians on the Ross Fork of Snake River, in Idaho Territory. Here and at a mountain camp twenty miles distant I obtained, partly through the assistance of the affable and efficient agent of these tribes, Major Wright, and subsequently by my own personal efforts with Major Jim's band of Bannocks, at Ruby Valley, Montana Territory, a solemn promise from all these Indians to abide by the terms of their treaty in Washington, and also that thereafter they would not enter the Park beyond Heart Lake, thus averting in future all danger of conflict between these tribes and laborers or tourists. To this agreement I am gratified to report their faithful adherence.

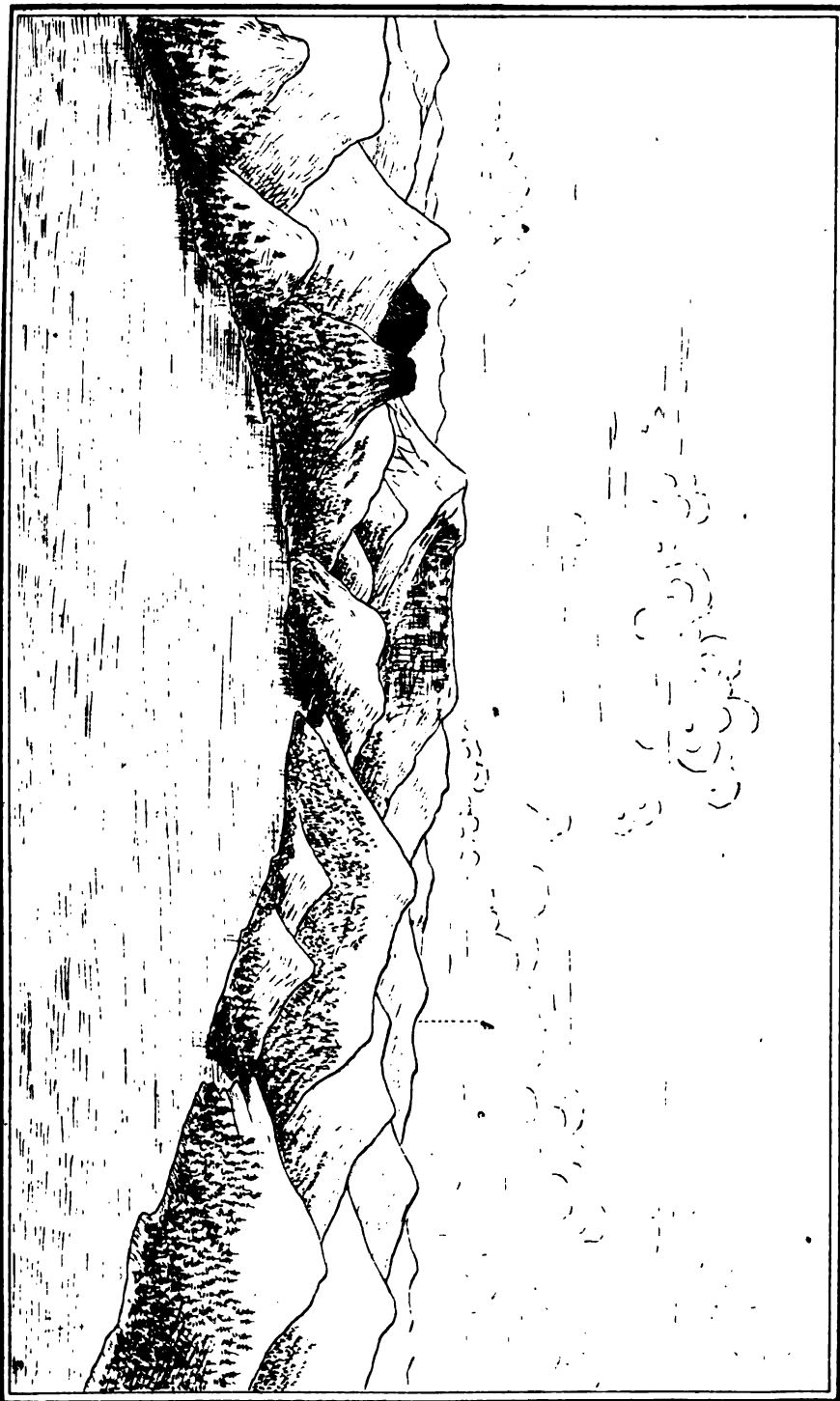
Proceeding on the Utah Northern Railroad to its terminus at Red Rock, and thence by coach through Virginia City to Bozeman, I there met my competent assistant, Mr. C. M. Stephens, with teams and an escort. His report of the snows and streams within and adjacent to the Park, corroborated as it was by persons at Bozeman and my own experience in crossing the chilly waters of swollen streams, induced me to inform the Chief Signal Officer at Washington, by telegram, of the backwardness and unusual coldness of the season, and also of the unprecedented depth of snow in the mountain passes and the floods in the valley streams, so that a warning might be given to any who contemplated a visit to the Park the present year, to defer the same until at least late in July. Ignorance of or inattention to this timely warning, by a number of tourists, resulted in many otherwise needless hardships, privations, and delays to themselves, and much unjust criticism and censure to myself.

Quickly procuring an outfit, arranging field parties, and leaving the train to follow, I left Bozeman, with the horsemen, on the 1st day of July, reaching here, eighty miles distant, on the evening of the 2d, our

wagons being delayed by terrific hail-storms until the 5th. On this date, Mr. O. J. Salesbury, with five horsemen, arrived by the Geyser route, on a tour of inspection of the road from the Utah Northern Railway for a coach and mail route; and being desirous of my assistance in selecting and reopening the same across the Park, before deciding to close a mail contract, I returned, in company with him and Mr. James Goodwin, one of my old scouts, over the Geyser road to the falls of the Gibbon. Having effected one crossing of this stream by swimming its swollen, ice-cold waters, and in the same manner having made five crossings (within a distance of six miles) of the waters of the Madison in its cañon, we reached the open valley below. The members of the party were unanimously of the opinion that this Cañon route was dangerous, if not, indeed, impassable during a large part of each year, and that it was likely to continue so during 1880, and there was neither time nor means to construct bridges or grades this season for a coach and mail route from the railroad direct to the headquarters of the Park. We were therefore compelled to seek a new route of entrance to the Madison end of the Park, and an arduous effort was immediately made to discover a more favorable approach. The rugged mountains to the north were evidently impassable, while we were ignorant as to whether the rocky cliffs of the southern elevated timber plateau had ever been scaled by either explorer or mountaineer. Scattering in parties of two, we attempted the ascent, and, though some were baffled by cliffs or cañons, within two days a route was discovered so unexpectedly favorable that its adoption and opening were immediately determined upon. Mr. Salesbury, leaving his men to construct a mail station where the cut-off would strike the Madison at Riverside, returned East to close his mail contract, while I returned to headquarters, remaining there until I had built an excellent blacksmith shop and barn, and repaired the bridges, fences, and grades in the vicinity. Subsequently, with some thirty men, two wagons, and a pack train, I started upon the Geyser road for the Fire Holes.

No one, lacking practical experience with untimely Sierra suows and floods, can form an adequate conception of the difficulties of repairing or constructing grades, culverts, or bridges, over fifty miles of mountain roads of the character of those in this region. All difficulties were, however, finally surmounted, and after fording both the Fire Hole Rivers near their forks with my party, I ascended a stream from the west, making camp where a bison-trail descended from the plateau to a cold-spring rivulet on the margin of a lovely, grassy valley, which, being dotted with spouting hot springs, we called Geyser Meadows.

As our proposed road was to descend from the plateau on a long, natura, winding turnpike between two cañons near the Forks of the Fire Holes, three miles distant, we opened the bison-trail for the saddle and pack animals to the line of road, exploring and working both ways. The cold-water streams of the valleys were still swollen, and numerous old snow-drifts remained upon the plateau; yet there were neither springs, streams, nor even lakes, the porous lava-ashes and loose gravel of the soil having speedily absorbed all the melted snow, while during the last five days of July the temperature was so low that a sufficient quantity of water was obtainable only by thawing snow-drifts, great piles of timber being heaped upon them and burned for that purpose. Although strongly flavored with smoke, pitch, and sometimes with alkali, this water was tolerably potable, and sufficed to quench our thirst until a cold rivulet was discovered just above its sink at the west foot of the plateau. Three miles from here we made the Madison below the cañon, twenty-one miles by that route and fifteen via the new one over the plateau from the



Mount. Br. Dec. 24, 1881, Part 5.

Southwestern extremity of Yellowstone Lake.

Trail Creek.

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Forks of the Fire Holes. We reached this point, where the Riverside mail station is now established, on the 7th of August, subsequently improving somewhat the northern ascent to the Terrace. This route possesses the advantage of being always dry; it is also well shaded by beautiful pine forests, and is six miles shorter than the Cañon route; besides, by this road, while there would be the expense for two long and somewhat steep grades, the necessity of building four long bridges and several expensive grades, exposed to snow-drifts and floods, on the old road would be obviated; and it is more than probable the new route would never be abandoned, although if necessary the old one could be used for a brief period each summer.

While on a tour of the more important portions of the Park, in August, with the honorable Secretary of the Interior and his party, the main force of laborers continued improving the Geyser road and other routes in that portion of the Park. Soon afterwards, with a small party and pack train, I proceeded from our headquarters to the Great Falls of the Yellowstone.

Having bridged several streams, including Cascade Creek at Crystal Falls, opened trails, and rendered safe the lookouts at main points of interest, as at Great Falls and the upper portion of the Grand Cañon, I left most of the party to open a trail along its brink, and, in company with Messrs. Jack Davis and W. H. Parker, both excellent navigators, ascended the Yellowstone River to its lake, and in a small, unsafe craft, called the Explorer, made the tour of the latter and its islands. We also ascended Pelican Creek and the Upper Yellowstone River to their rapids. After encountering several heavy gales, one severe snow-storm, and a shipwreck, I ascended Mount Chittenden and other peaks of the range, crossed two passes to the Passamaria or Stinking Water branch of the Big Horn River, and returned to the foot of the lake and falls. Thence, while the main force was opening a trail between Mount Washburn and the Grand Cañon, with a small party I opened a route of ascent to the former, and also one of descent to the latter, where, at a depth of 1,300 feet, was found a beautiful and unique geyser basin, whence, by exceedingly toilsome and dangerous sheep-paths, we descended (mainly within) and explored the Grand Cañon to Tower Falls. This trail is much shorter and better than the old one over Mount Washburn, and opens up such matchless scenery along the Grand Cañon that it will doubtless soon supplant it.

Finding at the Forks of the Yellowstone the noted guides Rowland and Miller, with the famous photographer of the Park, Mr. H. B. Calfee, my assistant, Mr. W. H. Parker, and myself joined them, and with them constituted the first party of visitors to the famous and exceedingly interesting medicinal springs, Hoodoo Basin, the matchless dikes and other unique marvels of the East Fork regions.

During this trip I ascended several snowy peaks of the broken and elevated Sierra-Shoshone Range, which extends from Pilot Knob to the Wind River range, and from a monument which I erected on Hoodoo Mountain took bearings of Mounts Washburn, Chittenden, Doane, Stevenson, and Pilot Knob, and of the Yellowstone and other lakes.

My return was via the petrified forests at the head of Pleasant Valley, headquarters being reached on the 4th of October.

While absent, my trusty gamekeeper, Harry Yount, who had left us at the foot of Yellowstone Lake, explored alone its western borders, the Shoshone, Lewis, Heart, and other lakes, and the basins of Barlow and Upper Snake Rivers, and, after tracing some excellent trail routes, and obtaining much useful and valuable information, returned just in advance of our party.

The season for labor in the Park continued, as it had begun, later than usual, permitting work upon the various bridle-paths and on the road up the Gardiner River. A good and well-located house was also constructed for the gamekeeper at the mouth of Soda Butte, a branch of the East Fork of the Yellowstone, and a favorite winter haunt of elk and bison. This, and my own explorations of the Gallatin Range, kept the entire party active until well into October, when most of the laborers were discharged. With the remainder, buildings and fences were repaired, tools and implements gathered and secured, and other preparations made for winter just in time to escape its severity amid the snowy peaks and passes. Elk, deer, and other game being driven by storms into the sheltered glens and valley, we were enabled to secure an abundant winter's supply of fresh meat, and also fine hides of the bear, wolf, and wolverine. Although severe and dangerous, hunting in the Park was excellent sport, and the only recreation I enjoyed during the season.

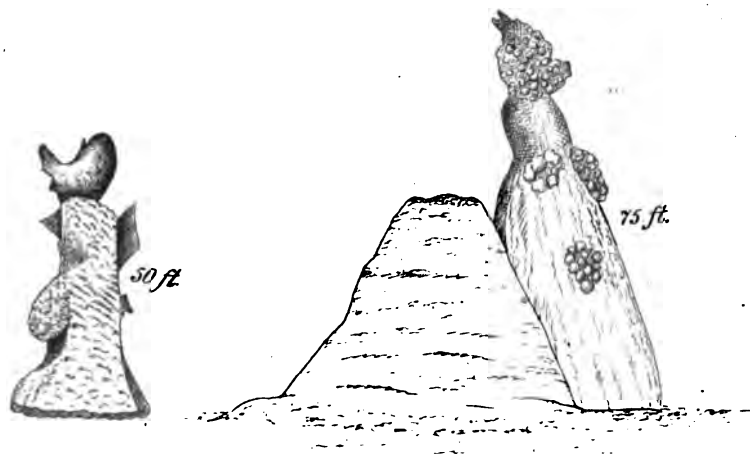
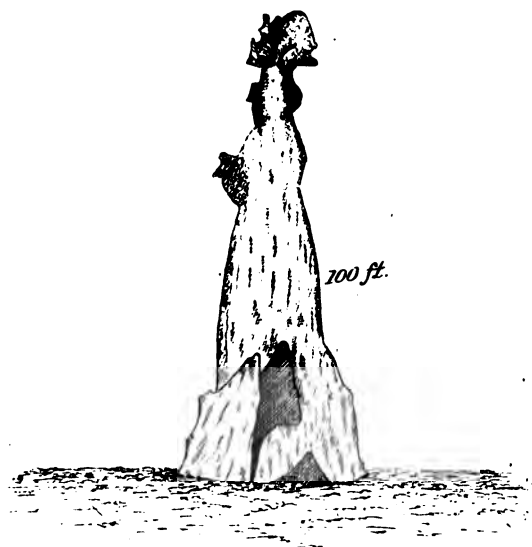
During the autumn, observations, and visits to Gamekeeper Yount's house, thirty-five miles distant one way, and to neighbor Marshall's, at the Forks of the Fire Holes, fifty miles the other; closing up business and preparing this report, including accompanying maps, tables of elevations of mountains ascended, and records of weather regularly entered, kept me actively employed until my departure late in November. At that time I left Harry Yount with one man at the gamekeeper's cabin on the East Fork of the Yellowstone, and my assistant, Stephens, with three men and the animals, at the Mammoth Hot Springs, and returned to Bozeman to liquidate my remaining indebtedness for outfit and supplies for the season. Thence, by coach, I went to Dillon, the present terminus of the Utah Northern Railroad, and by that road to Ogden, where I took the usual railroad route and returned to the East.

EXPLORATIONS.

As stated in my report of 1879, the want of funds adequate to such protection and improvements as are absolutely required in the Park has constantly prevented explorations not only desirable in the interest of science, but also necessary to an intelligent and judicious expenditure of the funds actually appropriated. The appropriation for the past season, however (\$15,000), was a sufficient increase over that of the previous year to admit of the employment of an active and reliable gamekeeper, who, besides attending to his regular duties, made, during the season, interesting explorations (see his appended report), and also to enable me during the favorable autumn to make extensive and valuable explorations in the known as well as in the hitherto unknown portions of the Park, accounts of which will be found throughout this report.

HOODOO REGION.

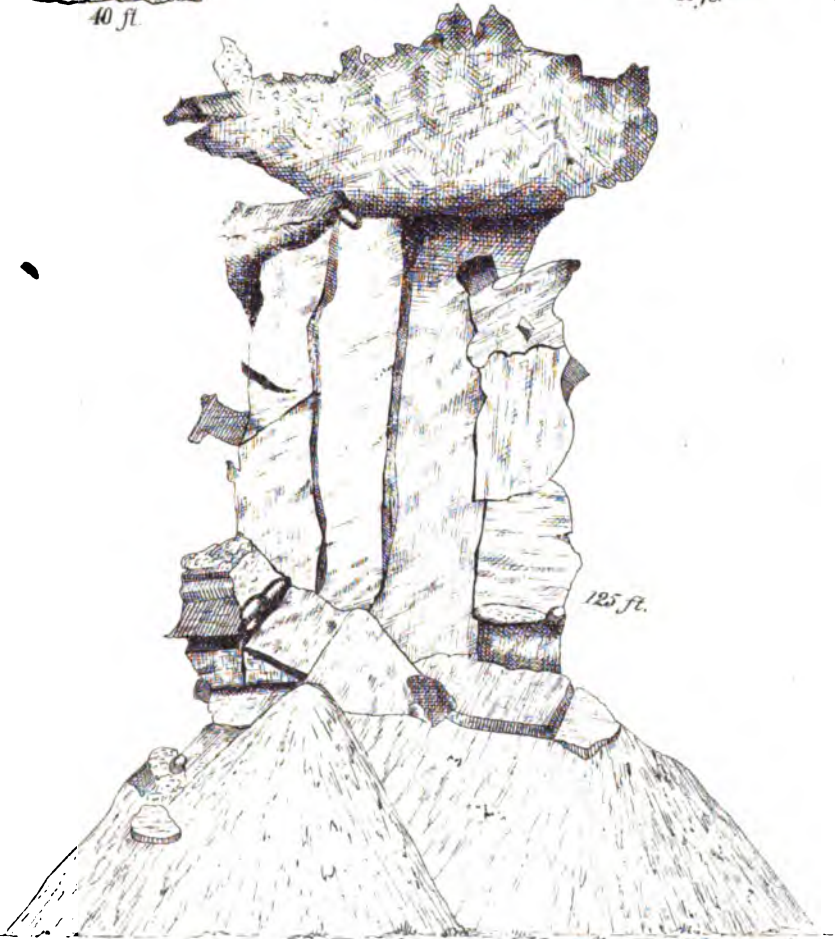
This is a mountain phrase which for years has been applied to a terribly broken and eroded portion of the Sierra-Shoshone Range around a portion of the head branches of the East Fork of the Yellowstone and the Passamaria or Stinking Water Fork of the Big Horn, and which, until my own visit of this season, had never been visited by any of the scientific tourists or government explorers of the National Park. In fact nearly all that was previously known of this region was from information derived from a small party of prospecting miners, two of whom,



HOODOOS

Or remnants of erosion in the Goblin Labyrinths

J. D. O.



HOODOOS

Crandall and Adams, were killed by Indians, while three others, Adam Miller and his two companions, narrowly escaped, after losing their horses and camp outfit, and were compelled to make a long and terribly trying retreat to the Old Crow Indian Agency in the fall of 1870. It was this party which discovered the Clark's Fork mines, and this region of countless remnants of erosion, so wild, weird, and spectral that they named it the "Hoodoo" or "Goblin Land." Few white men have visited it, and fewer still who have ventured there returned. Miller, Rowland, and myself narrowly escaped from the Indians during our effort to visit it in the fall of 1878; but seeing no Indians in the Park this year, and deeming it important to ascertain the true character of this region before fixing the permanent boundaries of the Park, with Miller, Rowland, and others, late this season, I made another effort to explore it. Ascending the deep, narrow valley of the East Fork of the Yellowstone, I visited a sulphur basin near the mouth of Cache Creek, and found upon it, two miles from its mouth, an important basin of medicinal springs, some of which are evidently similar to those of the Soda Butte, while others are of alum or sulphur; and in the channel of the stream several huge, hissing caldrons of hot water of unknown properties. Some seven miles above Cache Creek we passed the mouth of another stream in a deep, narrow, timbered valley which we named Calfee Creek, after the famous photographer of the Park. Five miles farther on we reached the creek which Miller recognized as the one he descended in retreating from the Indians in 1870, and which, on this account, we called Miller's Creek. Some miles from the mouth on a southern branch of this stream we found another basin of mineral springs similar to, and in a nearly direct line south of, those upon the Soda Butte and Cache Creek.

Ascending Miller's Creek to its forks, and, by long and severe effort, scaling the elevated plateau between them, within forty miles from the mouth of the Soda Butte we found the decaying brands of Miller's old camp-fire. Just above were still standing the poles of one Indian lodge, while there were more than forty others that had fallen, but which evidently had been used the previous year; many still older also remain to mark this habitat of the red man. These poles are near the summit of an open, grassy pass between Hoodoo and Miller Creeks, close by a dwarf-timber-fringed pond at the foot of an old snow-field on the side of Parker's Peak, and within sight and easy striking distance of rough, elevated passes to Crandall's Creek (a branch of Clark's Fork), and other passes to the Stinking Water. Hidden upon the flanks by snowy mountains, and in the pass by a screen of dwarf pines and balsams, and with a precipitous descent over the snow-fields to Hoodoo Creek, this Indian perch commands a fair view of all approaches. Abundant pasturage for game and domestic animals was had in the notches of the numerous adjacent cañons. This position, therefore, formed one of the most secure lairs and admirable lookouts for hostile Indians that I have ever met with, and also bears ample evidence of its frequent summer occupancy. Fragments of china-ware, blankets, bed-clothing, and costly male and female wearing-apparel here found, were mute but mournful witnesses of border raids and massacres.

Convinced that there were at that time no Indians in the vicinity, and leaving Handford with our animals at Miller's old camp, I pushed on some three miles to explore the Hoodoo Mountain and its labyrinth. While Miller with Calfee and Parker explored and obtained sketches and views of many of the weird wonders of erosion, with Rowland I ascended and took the elevations of the adjacent peaks, including the Hoodoo Mountain. The latter was found to be 10,700 feet high (ane-

roid-barometer measurement) at the western end, where we erected a monument.

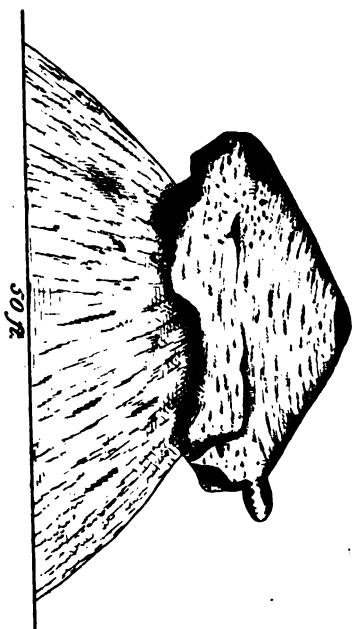
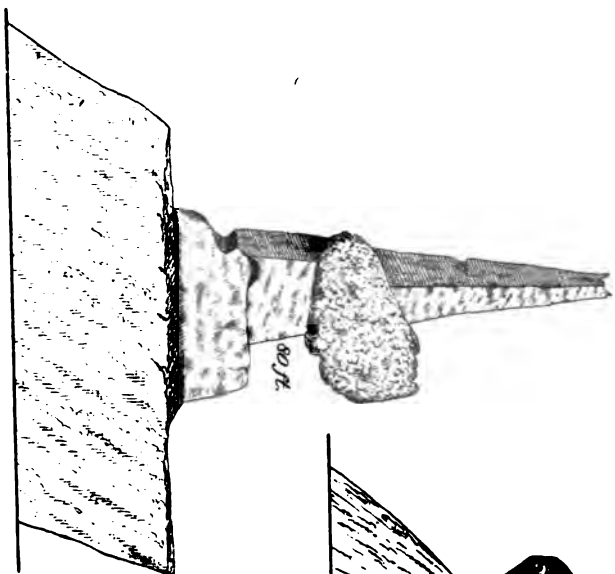
This mountain is about one mile in length, with a horizontal ridge-like crest, trending nearly northeast and southwest, and is the real water-shed of the various fountain-heads of the East and Clark's Forks of the Yellowstone, and nearly that of the Stinking Water branch of the Big Horn River; and though Saddle Mountain and some other adjacent peaks are somewhat higher, none of them are so isolated and prominent as a landmark. While probably never itself a crater, Hoodoo Mountain is evidently of volcanic origin, and was eroded into its present form. Upon its southern face it is still changing. Here, extending from 500 to 1,500 feet below the summit, the frosts and storms of untold ages in an Alpine climate have worn about a dozen labyrinths of countless deep, narrow, tortuous channels amid the long, slender, tottering pillars, shafts, and spires of the conglomerate breccia and other remaining volcanic rocks. In shape they are unlike any elsewhere known, being a cross between the usual spire and steeple form, and the slender-based, and flat, tottering, table-topped sandstone monuments near the Garden of the Gods, in Colorado; and while lacking the symmetry and beauty of these, surpass both in wild, weird fascination. Here the sharp-cornered fragments of rocks of nearly every size, form, formation, and shade of coloring, by a peculiar volcanic cement attached sideways, endwise, and upon the tops, sides, and, apparently, unsupported, upon each other, represent every form, garb, and posture of gigantic human beings, as well as of birds, beasts, and reptiles. In fact, nearly every form, animate or inanimate, real or chimerical, ever actually seen or conjured by the imagination, may here be observed. Language does not suffice to properly describe these peculiar formations; sketches may probably do something, and photographs more, to convey a conception of their remarkable character, but actual observation is absolutely necessary to adequately impress the mind with the wild unearthly appearance of these eroded Hoodoos of the Goblin Land. These monuments are from fifty to two or three hundred feet in height, with narrow, tortuous passages between them, which sometimes are tunnels through permanent snow or ice fields where the big-horn sheep hide in safety; while the ceaseless but ever-changing moans of the wild winds seem to chant fitting requiems to these gnome-like monuments of the legendary Indian gods.

Another feature of the Hoodoo region is worthy of more attention than it is here possible to give. I refer to the numerous huge dikes which trend uniformly in parallel lines nearly north and south, unaffected in course, size, or character by yawning cañons or the thousands of feet of craggy mountain sides, to their snowy summits, ever standing high above the softer and deeper disintegrating volcanic formations between them. While all basalt, obsidian, and other columnar formations observed within the Park, when found "in place," are uniformly vertical or radiating, these dikes, although as clearly columnar, are, in every observed instance, positively horizontal, very hard, and not friable, and part, in columns entire, across the dikes, thus appearing like gigantic steps ascending the cañon and mountain sides.

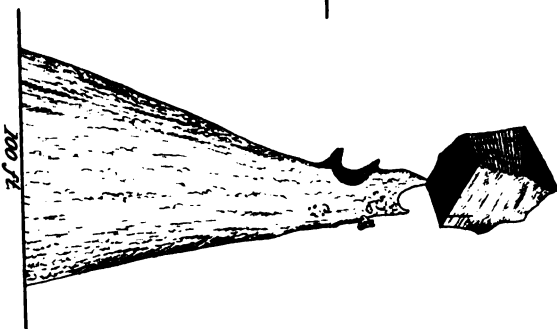
GALLATIN RANGE.

This range, so noted for its ragged basaltic formation, and sharp, unbroken crest north of Electric Peak upon the borders of the National Park, exhibits therein some novel peculiarities. Although retaining its

Fig. 100



HOODOOS



Or remnants of erosion in the Goblin Labyrinths

north and south trend and character as a divide of the waters of the Yellowstone and Missouri, where it is severed by the yawning cañon of the Madison Fork of the latter, still on much of the intervening distance it presents not only a double line of peaks, but also a clearly distinct formation, outline, trend, color, and weathering of each. The western range, as viewed from the deep valleys of the West Gallatin and the Upper Madison Rivers, presents a nearly continuous outline of reddish rocks of a friable formation, like coarse grained sandstone or crumbling granite, and serrated by the peaks of the somewhat higher eastern range. The eastern range, from the valleys of the Gardiner and the Gibbon, shows the sharp outlines of a light gray Carboniferous limestone upheaved to the vertical in cross-sections to the trend of the mountain, the intervening yawning cañon clearly revealing the contiguous western range. Thus not only have Mounts Holmes and Quadrant and Bell's Peak each a sharp, naked crest of nearly equal height, but also several other peaks somewhat less elevated, but with outlines equally clear-cut; and where these cross-cañons reach the depression between the two ranges there are a number of small but beautiful Alpine lakes, notably high up on Mount Holmes, where at least three of them, in their deep, ultramarine waters, mirror in perfect but inverted beauty their dark fir and cedar borders, and the rocky crags, snowy sides, and naked crests of the surrounding peaks. To these interesting features of this prominent range add the great probability of finding more valuable minerals than in any other part of the Wyoming portion of the Park, and we have an inviting field for scientific research.

Between Mount Holmes and Bell's Peak is the pass through which the hostile Bannocks entered the Park in 1870. There is also another pass north of Quadrant Mountain, and still a third south of Mount Holmes, all direct and of easy ascent through the main range from the east, but steep, precipitous, and difficult down the slopes of the western range. The main range, rising from the east in long, graceful, and well-timbered terraces to an altitude of about 9,000 feet, then separating into sharply-outlined peaks, naked but for patches of permanent snow-fields, presents a beautiful appearance, particularly from the Terrace Pass and Gardiner Valleys. The western range, however, is more abrupt, continuous, and naked; but, serrated as it is by the three sharp crests of the eastern range, its outline is, perhaps, as interesting as that of the main range, as seen from the deep valleys of the West Gallatin and East Madison; while, seen from several of the peaks, the view in either direction is extended and charming. It is also an excellent as well as an accessible region for game, the presence of big-horn upon its crests, grizzlies in its deep timber-bordered gulches, countless water-fowl in the emerald lakes of its terraced foot-hills, elk, deer, antelope, and occasionally bison, in its charming parks, glens, and lovely open valleys, constituting it a most prolific field for sport.

MADISON PLATEAU.

This mountain barrier, hitherto deemed inaccessible, was when I was forced to explore it, found to be a dry, undulating, but beautifully timbered plateau, allowing a judiciously located line of wagon-road with nowhere an elevation much in excess of 1,500 feet above the Forks of the Fire Hole River, and which is so much shorter, safer, and cheaper of construction and preservation than the old Cañon route that it will doubtless supersede it. It also affords approaches to several interesting mottled obsidian cliffs and cañons, and to exceedingly favorable points

for observation of the Fire Hole Basins above, and the Upper Madison Valley, Tyghee's Pass, Henry's Lake region, and the Snowy Mountain borders below it.

MOUNT STEPHENS TRAIL ROUTE.

The great saving in distance by a trail from the Mammoth Hot Springs direct to the Great Falls of the Yellowstone, induced me to explore a route from the Cascades of the East Gardiner, through a pass in the Stephens Range east of Thompson's Peak, and through another pass of the Washburn Range, at the head of a fork of Cascade Creek some miles west of Dunraven Peak. These passes, though elevated, are both practicable; but the numerous deep yawning cañons on the head fountains of Tower Creek, and continuous miles of dense fallen timber there and upon the west fork of Cascade Creek below the mountain lake will doubtless delay the opening of a trail upon this route until other trails more pressingly necessary shall have been completed; but the saving in distance, the romantic scenery, and the unexplored fossil forests on the head of Tower Creek will eventually render its construction justifiable.

GRAND CAÑON OF THE YELLOWSTONE.

There are several interesting cañons upon the Yellowstone, both within and without the National Park, but that uniformly called the Grand Cañon of the Yellowstone extends from its Great Falls to those of Tower Creek, a distance of something more than twenty miles. It had been entered and explored by several parties at both ends, but, before this season, nowhere else, except by myself near the spur of Mount Washburn, as mentioned in my report of 1878. Deep snows and high waters rendered this season unfavorable for the exploration, but by long, arduous, and dangerous cliff-climbing I succeeded in exploring the most of the cañon from within, and the remainder by following its western brink.

Leaving to future scientists the tracing of the geological periods and formation of this interesting region, I may in a general way state that, like the Niagara and other great cataracts, the cataracts of the Yellowstone have eroded a deep channel up-stream, far above their original location at the severed spur of Mount Washburn and the rim of the then and elevated Yellowstone Lake, at which time the fall of one, or that large of a succession of these cataracts, was far greater than at present.

It is neither certain nor practically material whether this cañon follows an ancient earthquake rift or is wholly one of erosion, as it evidently cuts through various formations to one of hot springs, often soft, shelly, and so easily eroded as, in connection with the remaining countless active ones, to occasionally undermine portions of the towering cañon walls, and thus precipitate enormous slides, especially of the western wall. These slides and the short but deep and narrow cañons entering them, compelled me to make a portion of the trail upon the slopes of Mount Washburn. There are many of these slides, of all dimensions up to at least a mile in length along the cañon, and half that distance from its brink; and the entire depth at each locality ranges from one to two thousand feet, thus damming the river until removed or cut asunder by its all-eroding power. Remnants of these, remaining as timbered terraces within the cañon, afforded the main routes of descent to the rapid, roaring river, which from above appeared like a thread of silver. Some of the side streams, notably one some three miles below the

Great Falls, pour over the eastern wall where it is about 1,300 feet high. It is not, however, like the Fairy or other falls, a clear leap; nor is it like a cascade dashing from projecting rocks, but a gliding fall down a flume-like groove, self-worn in the nearly vertical wall, and which, though a good-sized rivulet at the brink, in autumn is nearly if not quite lost in spray before reaching the river. Some of these streams descend by beautiful cascades or in dark narrow cañons, and others, as the Twin Falls, by cañons to the remnants of old slides, and thence, by a clear, beautiful leap of some two hundred feet, reach the river nearly opposite; while there is a similar fall from the eastern terrace less than a mile below. Between these, after making a descent of 1,300 vertical feet, past the noisy Safety-Valve and countless other geysers and brimstone basins within two miles, the Twin Falls trail reaches the river amidst rocky walls whose cornice-like formation possesses a variety and brilliancy of tint and coloring, matchless and enchanting, which it is impossible to describe, and which to be understood and appreciated must be seen. Indeed, in many portions of the cañons the coloring of the walls is the principal charm. The Grand Cañon of the Colorado is longer and deeper than this; the Yosemite more accessible, and to some, perhaps, more attractive, while other cañons are more ragged, weird, and yawning; but no known cañon so combines magnitude, meanderings; foamy, emerald waters; hissing hot springs, spouting geysers and inimitably beautiful tinting of its walls as the peerless Cañon of the Yellowstone.

YELLOWSTONE LAKE.

This doubtless mere fragment of an ancient inland sea, or great lake, of perhaps hot or tepid water, surrounded and dotted by active volcanoes, has been so long and yet so imperfectly known, and in trapper legends has been presented in so many different localities, shapes, dimensions, elevations, &c., that it appropriately merits its designation of "Mystic Lake." It has, however, been found to be one of the largest, most elevated, and peculiarly formed of all the mountain lakes of North America, and yet is comparatively so little known as to offer a most inviting field for romantic and interesting exploration.

The earliest published reports of this lake are those of Doane, Langford, Everts, and others of the Washburn expedition, who visited it in the fall of 1870. The first white men, however, known to navigate its blue waters were Messrs. James Stevenson, W. H. Holmes, and others of the Hayden expedition of 1871; their craft was the Anna, a small but well-constructed canvas boat. With the Explorer, made of green, whipsawed lumber, and which soon proved unseaworthy, my own navigation of this lake was made with two companions, Capt. Jack Davis and Mr. W. H. Parker. Suffice it to say, that after a voyage of ten or twelve days, and after encountering many mishaps and dangers, being once beached and fairly frozen in, we succeeded in circumnavigating the main lake and most of its bays and fingers; and with the first craft navigated by white men I ascended Pelican Creek, the Upper Yellowstone, and other streams to their rapids. While this exploration developed nothing to cause an essential change in my views of the general contour of the lake, as given in my last year's map, it furnished strong evidence to sustain my previous opinion that the length of the lake from the upper river inlet to the outlet is nearer thirty than twenty miles, and but little less across the palm and thumb, and also established Stevenson's soundings (published in Hayden's map of 1871) as approximately correct, since I seldom found soundings any distance off shore with a 255-foot line.

Interesting information of a varied character and data of much value were obtained relative to contours of bays, coves, and islands; sizes, number, and nature of tributaries; climate, prevailing winds and storms, &c.; while uniquely interesting evidences were encountered of erosion upon its wave-lashed shores, some of which will be given on an accompanying map, and others particularized in their proper connection in this report.

Although the Upper Yellowstone is navigable for three miles for small sail and steam boats, and without doubt is a fair-sized mountain river; and although the enormous quantities of huge pine, spruce, and fir timber piled for miles along its banks and the lake shore below its mouth, indicate that it is a boisterous and foaming stream during spring and summer floods, still its inlet as compared with the outlet is too insignificant to satisfy me that the combined tributaries of the lake more than equal its discharge; the immense quantities of water lost by evaporation remain, therefore, to be accounted for. True there is probably much less evaporation from water at its temperature and great height than is usual from a less elevated water surface of equal extent; and it is also true that the two or three feet of autumn drainage from the high spring or summer surface of the lake must be considered; in addition great subterranean feeders or countless large springs beneath its surface remain to balance this evaporation. That so large a body of water, with a vertical elevation one and a half miles higher than many of the principal cities of the East, and half a mile higher than the highest mountain peaks of that region; itself begirt with snowy mountains thousands of feet higher; its shore-lines dotted, and doubtless its depths modified by deposits of scorching sulphur, seething geysers, and boiling hot springs—that this body of water should possess many rare and interesting features is not unreasonable. Among these is one now admitted, viz, that while there is usually, in summer, a calm during the latter part of the night, and a slight breeze up the lake in the early morning hours, by eight or nine o'clock a. m. the breeze is down the lake; it is first upon the mountain and island crests, high above the lake; then, suddenly striking the water, it uniformly soon becomes a strong, continuous wind, and not infrequently a tearing gale. But any time in the warm season (and nothing is known of it in any other) this lake is subject to sudden changes of atmospheric temperature and direction and force of the wind. This is the case when passing not only into range of each separate finger and the thumb, but also into the draft of the palm or main lake, where in autumn, within half an hour, I have experienced the change from a stiff regular breeze from one quarter to sudden, shifting puffs from nearly every direction, which soon culminated in a terrific gale with wind diagonally downwards, so luffing the sail and chopping the waves as to threaten my craft with instantaneous swamping. On this account, and because of narrow deep seas, rocky shores, and sparse anchorage, this lake, while one of the most beautiful and interesting, is one of the most dangerous for sailing craft. I am confident, however, that with even a small steamer, well built and managed, there would be little danger attending regular trips around the fingers, thumb, and palm of the lake, and for at least seven miles down the river to the Nez Percé Ford at the Mud Volcanoes. Indeed it is probable that ultimately this lake and its river will be navigated much farther, and near to the Great Falls. This point is distant some thirty or forty miles by the meanderings of the river, which, bordered by enchanting landscapes, is one of the loveliest of streams. With a suitable steamer making regular excursions of, say, three hundred miles, it is safe to predict that a hotel on

some one of the many charming terraces near the foot of the lake would ultimately prove a profitable investment in this region of wonders.

ROADS, BRIDGES, AND TRAILS.

The time and funds spent in constructing the road over the Madison Terrace, on the route of entrance from Henry's Lake, and the numerous repairs to bridges, culverts, and grades, many in number and great in size, which were rendered necessary by the deepest winter snows, highest spring floods, and the latest-opening summer ever known in these mountain regions, compelled me to abandon for this season my cherished desire to construct a very important line of road from the Upper Fire Hole Basin via Shoshone Lake, thence down the Yellowstone to its foot and falls, via Mary's Lake, down the East Fork of the Fire Hole River to its forks. But, the entire trail of last year was somewhat, and portions of it greatly, improved and prepared for a road. As just stated, great improvement was made in the road up Fire Hole River, while a road valuable to tourists was opened across a bend of the river by way of the terrace of the great midway spring, which developed many mineral springs and geysers of great interest and beauty, and hitherto unknown.

After abandoning the Madison Cañon road I opened a direct and excellent route from near the Forks of the Fire Hole through a corner of the earthquake-shaken region into the old road along the Gibbon, bridged the Norris Fork and other branches, and constructed long and expensive causeways, turnpikes, and grades there and along Obsidian Creek and Cañon, as well as along the cañon of the Gibbon.

The expensive grades and bridges along the mountain side below the Mammoth Hot Springs required little repair, but the grades up the Terrace Mountain considerable.

The road to the Forks of Gardiner River has been extended across both its branches, and up the eastern branch nearly half-way through its terrible cañon, necessitating a grade of over 1,000 feet within two miles. The trail and bridge at Tower Falls have been somewhat improved, but require much additional attention.

Little was done on the old trail over Mount Washburn, since, in my opinion, it will soon be practically superseded for general travel by the new one between it and the Grand Cañon.

Routes are explored, and trails will be needed next season, to the newly-developed Hoodoo regions, as well as from Shoshone Lake, via Lewis and Heart Lakes, and Red, Sheridan, and Flat Mountains, to the Yellowstone Lake.

TRAIL AND PROPOSED ROAD ALONG THE CAÑON OF THE MIDDLE GARDINER RIVER.

As fully demonstrated, with a moderate outlay on a long steep grade on this trail an excellent road will be afforded, and as between it and the present road over Terrace Mountain a choice of routes may be had. An easy day's ride will then enable the tourist to obtain a view of the Mammoth Hot Springs, both from below and above; of the eroded valleys of all the Gardiner Rivers; of the falls of the Middle Gardiner, nearly two hundred feet high; and of its cañon, twelve or fifteen hundred feet deep, with its basaltic columns, spires, and steeples towering amid scenery second only in wild, majestic beauty to that of the Grand Cañon of the Yellowstone. He will then also be easily able to visit the

Rustic Falls of the West Gardiner, with its yawning cañon water-way below and the decaying wickenups and game drive-ways of the Sheep-eaters above it, and their ancient but not remote haunts at the cliffs; also, by easy ascent from the summit of Bunsen's Peak and the Terrace Mountain, to enjoy the enchanting view of the adjacent smiling valleys and snowy mountains, and the sharp peaks of the Tetons, dim amid the clouds, fully a hundred miles away.

GUIDE-BOARDS AND MILE-POSTS.

As stated in my report of last year, I made use of fragments of lumber which had been hauled nearly one hundred miles to our headquarters, for making a large number of sign-boards, which were well painted, and lettered with the names of prominent geysers, salses, paint-pots, and other hot springs, and falls, cañons, roads, and other natural and artificial points of interest. These, after difficult conveyance, often over long distances, were firmly affixed to posts, rocks, and trees, and proved, as was anticipated, of great value to all persons visiting the Park; but the result of this experiment has neither justified the expectation that they would remain where affixed, nor proved their usefulness, nor the propriety, under present circumstances, of an increase in their number. It is found that posts placed near enough to prominent geysers to properly designate them, unless unusually well set, are liable to be washed away; also, that the lettering upon the boards in such localities, as well as near important salses and other hot springs, is, from chemical action or the direct effect of hot water and steam, liable to be rapidly obliterated. Ordinary iron would probably oxidize or corrode, and stone crumble; and it is therefore important to ascertain some mode of making and affixing guide posts or boards that will render them of permanent service. Some of the sign-boards I erected were destroyed by forest fires, and others crushed by falling timbers or swept away by floods; but the greatest havoc among them has not been wrought by time nor by the elements, but, on account of their usefulness, by wantonness and vandalism.

While the leading men of intelligence of all classes and stations in life in these regions, as elsewhere, have mainly been the warm and reliable friends of the National Park, of all efforts for improvements therein, and of the persons most active in making them, there have ever been among the many honest and reliable guides and mountain-ramblers within and adjacent to the Park a few of a widely opposite disposition. The latter usually divide their time between acting as guides and pillaging, plundering game, valuable natural specimens, and often the outfit of those employing them, their ill-gotten gains being squandered in the vilest haunts of the neighboring towns, while they there lie in wait to entrap fresh tourists. These men, usually having neither ability, principle, nor habits suited to honorable employment, prefer to continue on in the lawless manner mentioned. Hence, like the ignorant, selfish, short-sighted, and often short-lived opponents of improvement elsewhere, they have constantly proved the greatest enemies of the Park and its visitors. They have been active, unscrupulous opponents of its exploration, and blatant slanderers, personally, and in the press when available, of those earnestly and honestly engaged in the improvement of this region. It is this small but despicable class of prowlers who, in addition to kindling devastating fires, slaughtering game, despoiling geyser-cones and other interesting formations, have, by extortionate de-

mands, robbed tourists, and who, to prevent the latter from following plain roads or trails, and from ascertaining routes and names of objects visited, have destroyed the boards designating the same. Hence I feel that the voice of all the better class of guides and mountaineer residents of the adjacent regions, as well as that of intelligent visitors from our own and other lands to this peerless region of wonders, will sustain me in urging the speedy enactment of laws to properly protect the Park, its contents, officers, and visitors, and the enforcement of the same by a body of determined police.

OBJECTS OF SCIENTIFIC INTEREST.

Well aware of their interest to the thinking portion of our people and their value to scientists everywhere, I secured many unique and valuable specimens of chalcedony, onyx, opal, and jasper, as well as various forms of silicified or crystallized ancient timber also petrified fish-eggs (so called), obsidian of various kinds and colors, &c., which, well boxed, are on the way to Washington via Bozeman and the southern or railroad route. Most of these were secured with great difficulty, often attended with danger, especially while exploring on rocky crags, in scorching sulphur basins, or on snowy mountain sides. None of the specimens mentioned in my last year's report, as sent in a small boat down the Yellowstone, and reported lost by wrecking at Buffalo Rapids, have been recovered, which is a serious loss to science.

Besides the deposits of obsidian, or volcanic glass, at the cliffs of Beaver Lake, which are unrivaled in quantity, beauty, and variety of color, there are large deposits of black and mottled obsidian at the Cascade or Crystal Falls, near the Falls of the Yellowstone, on the Continental Divide near Shoshone Lake, at the Lookout Cliffs, upon the new road over the Madison Plateau, and in other localities, while immense quantities of scattered fragments are found in the valleys, and minute particles sparkle like diamonds along the beautiful shore-lines of the Yellowstone, Shoshone, and other lakes.

Eroded fragments of fossil wood abound along the streams and lakes of the Park, while in many of these are beautifully-rounded fragments of geyser-cones and various kinds of hot-spring formations, and beautiful concretions from ancient or recent salses and paint-pools. The cones, branches, and even trunks of trees, are often found semi-petrified in the hot waters of the geysers, salses, and other hot springs and their outlets. Indeed there are but few of these springs whose waters will not, within a few months, so change any woody fiber, even the peculiarly light pine and cedar, as to cause it to sink. These fossilized woods retain their forms, but are clearly distinct in degree and character from the ancient fossil forests high up amid the basaltic terraces.

Along the mountain sides east of Yellowstone Lake are ancient terraces, shore-lines, and other indisputable and indelible evidences that at no remote geological period the surface of this lake was at least five or six hundred feet higher than at the present time; and that, like Shoshone and other lakes, which are being drained into opposite oceans, it is only a fragment of an ancient elevated inland sea or lake, bordered and dotted by active volcanoes, which have vomited into its perhaps tepid waters streams of lava, which have cooled into basalt, breccia, and other forms of more or less horizontally stratified rocks, beds, or deposits. With the intervening periods of time, and changes in the lake's surface, much of these deposits has crumbled or been broken or eroded away, and redis

tributed in less elevated deposits, which the Alpine climate and lashing waves of the lake are now rapidly undermining, as evinced by the countless specimens of the hardest and heaviest portions of the mingled débris of all the preceding formations and erosions which strew the beach. A notable locality for these uniquely interesting specimens is upon the northeastern shore of the lake between the mouth of Pelican Creek and Steamboat Point, where the shore, the valley of Pelican Creek, and the plateau between, are still dotted with the dwindling geyser and other hot-spring remnants of ancient subterranean fires.

At Steamboat as well as at Storm Point the deposits or other effects of continuous hot springs have better withstood the action of the waves than the six or eight miles of intervening shore, which, somewhat less elevated and with fewer hot springs, has been shaped by erosion into the beautiful Saint Mary's Bay, an extension of which, reaching nearly to Indian Pond, I named Concretion Cove.

At Steamboat Point the contest, for ages, of hissing hot springs and lashing cold surf to adjust their respective boundaries, has left interesting monuments of the diverse powers and operations of each combatant, and also furnished a rare field for obtaining a peculiar class of specimens, including much sulphur. Storm Point offers specimens somewhat similar, but less sulphur and also more beautifully banded and colored indurated clays, shales, and other formations, notable alike for the beauty of their variegated stripes and their tendency to crumble. Here I obtained a number of specimens, the brightness and variety of coloring of which are seldom found in nature or equaled by art. But it is along the surf-lashed shore of Concretion Cove that are profusely strewn the most peculiarly interesting specimens of their class that I have found in this region of wonders, and which rival any natural curiosities I have met with from other parts of the United States or from foreign lands.

Pelican Creek, in its twelve or fifteen miles of meanderings from the mountains to its mouth, some three miles south of the foot of the Yellowstone Lake, divides a beautifully undulating plateau of alternating grassy plains and parks, where lovely groves of branched pines are flanked upon the north by elevated sulphur hills with forest-clad base, sulphur-scorched sides, bald, snow-white, and terraced crests (a noted landmark across the Yellowstone Lake), and on the south by the Turbid Creek spur of Mount Chittenden. This plateau is evidently a comparatively recent formation of the crushed, eroded, mingled, and redistributed débris of all the preceding formations of this mystic lake. It is usually found heavily banded or stratified with pudding-stone, conglomerate, or breccia. Other specimens exhibit thin, wavy laminæ, all greatly disturbed, and often curiously banded and colored in circular formations, while firmly cemented by silica or deposits from the seething funnels of countless deep-seated subterranean hot springs, which continue to dwindle in number and power. Hence the immense quantities and varieties of interesting specimens of concretion and erosion plainly visible in nature's tracings along the steep cliffs, and the innumerable specimens strewn along the rocky strand of the ever lashing and eroding waters at their base.

Abruptly changing in character with the cliffs whence they were eroded, here are found, now variously-colored cobble-stones, with mingled and adhering fragments of the cement of the pudding-stones; now the eroded fragments of various forms of fossil wood, quartz, and crystals; and now a shingle beach of hard, fine-grained, oval-edged, gray, and probably concretionary clay formations, from one-half to an inch in thick-

ness, six to eighteen inches long, and of various widths. In form these concretions vary from a shoe-sole to a pot-lid, from a rolling-pin to a pestle; in fact, ladles and platters of every description and size are among these formations. Perhaps, however, the most unique and rare patterns are the cups, pitchers, and lather-boxes, the last-mentioned being notably uniform in color, size, banding, and form, and many of which so closely resemble lathe-work as on first sight to deceive. Although uniformly concave on one side and originally convex on the other, many of them, by splitting along some of their well-defined lines of stratification, show a perfectly flat bottom, thus presenting a miniature lather box or cup, suitable for use or ornament. I have at various times deposited examples of these in the National Museum at Washington, and in other museums and cabinets of natural curiosities.

There are several of these remarkable beaches in the immense shoreline of the main lake and its thumb and fingers, but the most extensive and interesting yet explored is at the head of Concretion Cove, on both sides of the outlet of Indian Pond, the shoe-sole and pot-lid forms being found in front and below, and the lather-boxes, ladles, and skimmers about half a mile above it. The first varieties are countless; the latter extremely rare. I have heretofore, in both official and unofficial publications, referred to these curiosities, at one time advancing a query as to their origin and formation, but which query I am not aware has as yet been satisfactorily answered. I now only state the facts, in the hope of inducing scientific investigation.

During the past season I made and traveled a fine trail from the open valley of Pelican Creek, first between long sloping hills, then through grove-dotted elevations, to Indian Pond, skirting its southern shore, amid the decaying brush, corrals, wickeups, and lodge-poles, to my camp on the bluffs; thence across the outlet to Indian Pond, about midway its half mile of length, and on by a fine trail route through mingled parks and groves to the first bluff on the south bank of Pelican Creek, and from there to Yellowstone Lake, about half a mile above its outlet.

From the open valley of the Pelican to my camp, some three miles, is a fine natural carriage-way, while the trail, a like distance to the head of the bluffs of the Pelican, is an excellent one; but the remainder of the route, owing to steep bluffs, a miry stream, and a valley of dense and fallen timber, appears a much greater distance than it really is. A bridge and other improvements are necessary to render the lower portion of the road good, and at some seasons of the year even passable. The usual route still is to cross the Yellowstone at Nez Percé Ford, seven miles down the Yellowstone River from its head; thence, following its eastern bank as closely as the cañons and fallen timbers will permit, to strike the Pelican above its first bluffs; from here to ascend the northern bank to its forks, and thence the North Fork for the trail to Amethyst Mountain and Soda Butte, the Middle to the East Fork of the Yellowstone, and the Southern to the various rough timber-obstructed passes to the Passamaria or Stinking Water. My favorite camp on the Yellowstone Lake (and it has evidently been a favorite one for the Indian) has ever been upon the grove-dotted bluff, elevated thirty or forty feet above the lake, directly fronting Indian Pond, where I left my boat while exploring Pelican Valley and Stinking Water Passes. This cove, so landlocked as to be safe except during southern gales, and the bluffs at its head will doubtless remain a chosen haunt for the scientist and tourist long after the now abundant evidence of its frequent occupancy by the Sheep-eater aborigines shall have vanished; the rude stone-heaps of their

wickeup sweat-houses being their most enduring monument, unless, indeed, at this most choice location in the Park an Indian cemetery may yet be found.

GEYSERS AND OTHER SPRINGS.

There are found within the Park a variety of both cold and hot water springs. Treating these springs in inverse ratio to the popular interest in the varieties, they are : the cold pure-water springs ; the cold medicinal springs ; the warm mineral, often poisonous, springs ; the warm medicinal springs ; the foaming or laundry springs ; the terrace-building springs, and the pulsating and the spouting geysers.

COLD PURE-WATER SPRINGS.

Cold pure-water springs are countless, excellent, and usually permanent, similar to those of other elevated mountains, and often large enough to supply a fine rivulet, such as the Big Spring Creek, near the Great Falls of the Yellowstone.

COLD MEDICINAL SPRINGS.

These are not numerous, the most important being those of the Soda Butte, Cache, and Miller branches of the East Fork of the Yellowstone, in the northeastern portion of the Park. The interesting ruins near these springs indicate that they were once hot, cone, or terrace-building, as, indeed, some of them still remain upon Cache Creek. The Soda Butte Springs are traditionally valuable for the cure of saddle-galled horses, and probably but little less beneficial than the Arkansas springs in treating rheumatism and some other diseases. In fact, I deem a leasehold of these springs, in a lovely sheltered valley, with matchless trout-fishing, amid the Fossil Forests and enchanting mountain scenery, as one of the most valuable of those within the Park.

WARM MINERAL SPRINGS.

Warm mineral or poisonous springs are found at a noxious sulphur basin at the head of Green Creek, and other localities near Beaver Lake ; they are also numerous along Norris Fork, the main Gibbon River, Pelican Creek, Turbid Lake, and Brimstone Basin, and also in the Grand Cañon of the Yellowstone, and elsewhere. The gases arising from these springs, as well as their waters, are usually injurious to health, and many of them are really poisonous, some of which I have so designated upon guide-boards along our roads, as a warning to tourists.

WARM MEDICINAL SPRINGS.

These springs seem to differ little from the cold ones, with which they are frequently intermingled, but their heat and vapors render them more convenient and valuable for bathing purposes. Examples of these springs are found at Cache Creek, the various Fire Hole Basins, and to a limited degree even among those of the Mammoth Hot Springs.

HOT FOAMING OR LAUNDRY SPRINGS.

These are found in the cañon of the Gibbon as well as that of the Yellowstone, in all of the Fire Hole Basins, and notably in the Geyser Meadows, west of the Forks of the Fire Hole Rivers. Although really hot

springs, the temperature of the water is far less than the casual observer would suppose, because much of the furious ebullition is caused by escaping gases. A careful analysis of these waters will alone demonstrate their properties, but many of them surpass any other water, either naturally or artificially prepared, for cleansing the skin, as well as blankets or clothing of any fabric.

TERRACE-BUILDING SPRINGS.

The description of the Mammoth Hot Springs as a typical representative of this class, in my report of 1879, is so full and complete as to require but little additional attention from those who have perused it. For those who have not I will briefly state that tortuous escape vents of deep-seated internal fire, in passing through the underlying cretaceous limestone, become charged with dissolving portions of the wall rock, and upon reaching the surface the water is discharged in pulsating throbs, each of which deposits a thin corrugated lamina of the calcareous substance held in solution.

This apparently slow but ceaseless process has resulted in building up beautiful scallop-bordered bathing-pools along the thousands of feet of terraced slopes adown the mountain side. Traces of iron and other minerals, held in solution, tint these formations with their own peculiar coloring, in vertical banding, presenting a view at once grand, unique, and inimitably beautiful. These Mammoth Hot Springs, although far the most important of the kind now active in the Park or perhaps the world, are insignificant to what they were when building the Terrace Mountain, or what other springs were at perhaps the same period when they built the enormous cliffs along the Yellowstone, at Bear Gulch, at Sheepsteater Cliff, upon the Cache, Tower, Pelican, and many other localities where these enormous deposits, destitute of active springs are now crumbling to ruins and eroding away.

PULSATING GEYSERS.

While these springs are frequently intermingled with those of the bathing-pools, and possess many features in common, they are in other respects very dissimilar. The bathing-pools or terrace-building springs are usually large pools of various forms upon a mountain slope, down which their escaping waters build the above-described bathing-pools and terraces; while the pulsating geysers are uniformly along a continuous fissure, building a steep ridge directly over it of nearly uniform horizontal elevation, sloping alike each side, or else a circular cone, which in height frequently exceeds the diameter or even the circumference at the base. The long or ridge form appears to have been more common formerly than at this time; indeed, the prevailing circular or cone formations over small escape vents from the internal forces is one of the many indications of their waning power. Peculiarly interesting views of these ridges are found in most of the Fire-Hole Basins, where, as well as in the cañons of the Norris Fork and main Gibbon, and the elevated Monument Geyser basin, and other localities, the cones of both active and extinct pulsating geysers are frequently found commingled. Among the largest and most interesting of both the cone and the ridge varieties are those amid the terraces at the Mammoth Hot Springs.

The Devil's Grotto is only one of countless huge cavities in the ridges which are from ten to fifty or more feet high above the encasing terrace formations, and from one-eighth to one-fourth of a mile long. Many of them are extinct and crumbling to ruins, but others, as that through

the end of which we cut our road upon the main terrace, are still active. Some of the circular cones are also active, but a large one upon the upper terrace, which was surmounted by several miniature cones, some of which Professor Hayden (I learn) removed to the Smithsonian in 1872, as I did one other in 1875, is now in the dying throes of extinction.

Two large and interesting cones of extinct geysers are found near where our road from the Fire Holes descends the terraces at the Mammoth Hot Springs, as shown in the frontispiece of this report. As there shown, the Devil's Thumb is mainly concealed by the terrace above the road and the Liberty Cap below it, near a group of ever-changing terrace-building springs, which are fully two hundred feet below the main Mammoth Hot Springs upon the terrace next above.

LIBERTY CAP.

To visitors to the Park or attentive observers of the published descriptions and sketches of its wonders, the famous monument called Liberty Cap requires no further description, but for the information of others it may be said that it is an extinct, pulsating geyser-cone, some fifty feet in circumference, which rises forty-five feet vertically above the present surface of the hot-spring formations, which hide an unknown but perhaps equally great, if not greater, portion of its base. Not only is this encasing support shelly and cavernous, but, like the much harder and more durable circular laminæ of the cone itself, it is crumbling away, and, as may be seen in a correct sketch of it, is greatly eroded near the base by time and the elements and is so deeply seamed and fractured as to continually threaten the dislodgment of masses sufficient to change its center of gravity and precipitate the fall and irreparable destruction of one of the most unique and interesting specimens of nature's handiwork as yet anywhere discovered. The settling of the encasing terrace deposits sufficiently to dislodge the timber which I inserted in 1878 to support the cone, proves that it lacks the firmness to properly sustain stone or iron supports, and it therefore becomes a question of scientific as well as practical interest whether a sufficient quantity of water from the much more elevated Mammoth Hot Springs cannot be cheaply conveyed into the ancient supply-pipe of the cone, if, as seems probable, it is still open, or, if not, alongside of it, in order to throw an ornamental column of water to any desired height. As my observations accord with Bunsen's theory, that these waters do not materially deposit within channels, conductors, or pipes, but only by evaporation at their termination, or edge, it is believed that the terrace-building properties of the water would soon encase this interesting cone with the inimitably beautiful-bordered pools of the terrace formation, and also ultimately surround it with an effective and permanent support. So strong is my conviction of the perfect feasibility of this plan, that nothing but absolute necessity for the use of all available funds for buildings and opening roads and bridle-paths has prevented my expending a moderate sum upon the experiment.

SPOUTING OR INTERMITTENT GEYSERS.

Without attempting to decide a mooted question among savants as to the true origin of these prominent wonders of the Park, I venture to state that successive years of careful observation tend toward the theory that, like pulsating geysers, salses, fumeroles, and most of the other kinds of hot springs, they are primarily escape vents for the earth's pent-up internal fires. In these vents the chemical action of escaping gas and

high-pressure steam produced by contact of this escaping gas-heat with the permeating surface-water, by dissolving the wall rock increases the heat and enlarges the orifice of these small, tortuous, and otherwise cooling fissure vents.

Slow, but sure and constant, change attends them all, and many, though probably not all of them, at the proper stage become true intermittent spouting geysers. This can occur only when the orifice is so nicely adjusted in height, size, and form to the power of the escaping steam and gas in the self-formed chamber beneath that the pressure of accumulating water for a time nearly or quite prevents its escape except through sympathetic fumeroles or natural safety-valves. But the constantly-increasing force from beneath ultimately overpowers the pressure of the water, when, after more or less subterranean rumbling, earth trembling, and sundry kinds of bubbling, gurgling, and spluttering, the aqueous monster seems fairly aroused, and then occurs the grand eruption. This is usually through one, but occasionally through several circular or oblong vents, cones, or craters with diverse kinds of throttlings and pulsations in the different geysers, each having its own peculiarities in color and size, and in the shape of the orifices, as also in the height, power, and direction of the column or columns of water and the length of the periods of eruption and of repose; and even these, as above stated, are doubtless slowly changing.

While the foregoing theory seemingly accounts for the usual manifestations of geyser eruptions, still the rending of huge geyser cones and the hurling of tons of rock, as have occurred at the Giant and New Crater Geysers and elsewhere, seem to indicate an occasional outburst of some greater power. Explosions of superheated steam or of gas; misplacement of the safety-valve upon escape vents of internal fires; infernal regions, or other places of pent-up power are occasionally suggested by phenomena otherwise inexplicable.

To the Upper, Lower and Midway Geyser basins upon the Fire Hole Rivers, and others less important upon the shores of the Yellowstone, Heart, and Shoshone Lakes, early discovered by others, my own explorations have added the Monument, the Norris, and the Paint Pool basins upon the Gibbon or its branches, the Safety Valve in the Grand Cañon of the Yellowstone, and several others, less important, in other portions of the Park, which is now so well explored that there seems little probability of additional basins of importance being hereafter discovered. Still, as my own explorations have mainly been made in connection with the ever-urgent duties of exploring or opening roads or trail routes, and the scientific explorers of the Park have labored under many and grave disadvantages during brief periods of summer sauntering, amid hostile Indians, doubtless interesting isolated geysers, or perhaps small groups of them, may yet be discovered. In fact so little, comparatively, is yet known of the number, size, and peculiarities of the various geysers or other springs of these regions that I deem it one of the most inviting fields for further scientific investigation, and recommend that provisions be made accordingly.

FOSSIL FORESTS.

As explorations of the fossil forests of the Park have each succeeding year greatly added to our knowledge of their area, magnitude, and wonders, during the past year I explored the hitherto unknown forests on Cañon Creek and other localities of the Yellowstone Range, Mount Washburn, and the basaltic range between the fingers of the Yellowstone

Lake; also those in the mountains east of it, in the Hoodoo region, and on the Stephens Range, besides many additional localities on the Pelican and Warm Springs Creeks, as well as other well-known forests.

It is now evident that the basins of the East Fork of the Yellowstone, Pelican, Tower, and Black Tail Creeks constitute a region of fossil forests where an excavation or erosion at an elevation of from 7,000 to 10,000 feet would most likely unearth the fossilized branches, trunks, and roots of the giant trees of some primeval forest. Whether the successive deposits now encasing these forests in some portions of the Park to a vertical depth of at least 4,000 feet are subaqueous or subaërial, or, as is probable, partly both, it is evident that great and long-continued oscillation of the surface and periods of submergence and elevation have occurred, as the roots of the fossil trees of these forests, little inferior in size to the "big trees" of California, often penetrate nearly, if not quite, through the horizontal stratum or layer of earth and rock upon which they grew, into the broken, shattered, and eroded trunks of the fossil trees beneath them. It is also evident, from the uniform character of the successive forests in vertical layers that the agents or influences for fossilization were for an immense period of time uniform and abundant, while those for crystallizing, though long continued, were at no period so abundant or uniformly distributed. In fact, it is not usually the largest trees, or forests of them, which are other than simply fossilized in the original forms of the timber, but, rather, limited areas of usually smaller and more scattering timber, originally concealed in the peculiar cement which fills every crack and cavity, not only of the wood but also of the encasing rocks and their interstices, with the most beautiful chalcodony, which, probably, after long-continued processes of cooling, has produced the famous caskets of brilliant amethysts and other crystals here found, and which, while elsewhere unequaled in nature, are considered inimitable by art.

NATURAL BRIDGE.

Although at various points in the Park, as on the plains, there are temporary bridges of shale or of indurated clays, formed by the undermining action of small, transient water-courses; and although in many of the basaltic cliffs and peaks within and adjacent to the Park (notably in the newly-explored Hoodoo region of the East Fork of the Yellowstone) there are natural fissures and rough-galleried passages through the crumbling peaks and turrets of the breccia or conglomerate formations, and also amid the immense debris of the fractured cliffs of the Mammoth Hot Springs; and while there are wind and storm worn tunnels through the sharp cliffs of crumbling sandstone, there is, as yet known, within the Park, but one substantial natural bridge of stone over a permanent stream. Upon the map accompanying this report Bridge Bay is shown for the first time. It has two small tributaries entering near its head some six miles up the west shore from the foot of Yellowstone Lake. At the entrance of the northern one is a shallow, marsh-bordered pond, perhaps a mile long and half a mile wide, which discharges but little water, and which is evidently the sand-spit-severed extremity of the bay. The southern one is a small creek, with a deep, narrow valley of alternating grassy glades and beaver-meadows, bordered by burned and fallen timber, and, within a distance of five or six miles, heading, in several branches, in the basaltic hills. This is Bridge Creek, appropriately named from a natural bridge over the north branch, about one and a half miles from the bay. From a remark in Dr. Hayden's report for 1871, it would appear that some members of his expedition had visited

this bridge, but this is all the evidence I have been able to find that any explorer of the Park, excepting myself, had discovered it before the season just passed. I first observed it in 1877, but, an immense mass of tangled and fallen timber intervening, I could not readily reach it, and hence made no attempt at its description. The north or bridge fork of the creek, though evidently a foaming torrent at the annual period of melting snows, in early autumn is a barely continuous rivulet amid the craggy bluffs above the bridge, where it is much enlarged by drippings from the overhanging walls of the chasm and the numerous springs of noxious-looking and nauseous-smelling water. What is now the bridge was once the brink of a cataract nearly one hundred feet high, over a ledge of peculiarly hard, durable, variegated trachyte upheaved to the vertical across the stream. Directly across this ledge countless ages of erosion have formed first a shallow, trough-like channel; then, or simultaneously with this channel, a vertical orifice, several feet long by one foot wide, between the strata, some two feet from the brink. There is a similar orifice eight or ten feet further up stream, so large and deep as to undermine the intervening brink of the falls, where the impetuous water and rocky debris, by first cutting a circular channel and ultimately greatly deepening it, have eroded one of the finest archways I have ever seen, which has about ten feet of stone support for a carriage-way above, and about thirty feet of water-way beneath. The chasm is fully spanned by the bridge, which, by measurement, I found to be twenty-nine feet long, and, including the above-mentioned vertical orifice, ten feet high above the top of the arch, and forty-one feet to the bed-rock of the chasm, which, at this point, is a rapidly-deepening cascade. As the two outside layers of the vertical strata are, on an average, considerably higher than the roadway between them, they form a rude but permanent railing. The vertical orifice, as well as the ancient channel, can readily be filled or floored with timbers. Moreover, this natural bridge is on a route which avoids the sand-spits, ponds, and gullies near the bay; and I cannot, therefore, doubt that as soon as funds are available for the necessary repairs to the bridge, and for the removal of the vast quantity of fallen timber upon the road, this route will be the one most traveled, and this natural bridge one day be crossed by thousands of eager pilgrims to this wonder-land. The well-worn game-trails over the bridge are evidence of its long and constant use as a crossing for elk, deer, and antelope; while from the actions of a huge grizzly, which I shot while rearing from his lair in a fallen tree-top, upon the western abutment, it is, I judge, used by bears as an ambuscade.

GOLD AND SILVER MINES.

While the volcanic and ancient hot-springs formation, or lake deposit, so characterizes the surface of the Park as to render improbable the existence of valuable mines in nearly if not quite all the Wyoming portion thereof, the mining operations of the past year have developed the presence of promising mines of gold, copper, silver, and lead in Bear Gulch, Crevise, Hellroaring, Soda Butte, and Clark's Forks regions, either within or adjacent to the Montana portion of the Park. Anticipating this, and believing, as has now been proved, that the three-mile strip of the Park in Montana was embraced in a treaty with the Crow Indians years in advance of the dedication of the National Park, I have not only abstained from any attempt to control it, but have openly pressed its recession, since it possesses no objects of interest, and hence, though it may be of value to others, it is utterly valueless to the Park. The ratification of

the Crow treaty for the cession to the government of all these mining regions unquestionably places this strip within the Park, and as its recession is pressingly necessary, it is hoped it will be made without delay.

The existence of granite and limestone nuclei in some lava-capped mountains along other boundaries of the Park renders possible the future discovery of valuable mines, but, if so, they can be re-ceded without cutting off any objects of interest, the retention of which may be desired.

SULPHUR, ALUM, AND OTHER VALUABLE DEPOSITS.

Unlike those mentioned under the last caption, the deposits of sulphur, alum, and other minerals, found in great quantities and possessing considerable scientific interest and commercial worth, are always found associated with hot springs or other wonders, and are inseparable from the Park. Of these, sulphur is perhaps the most widely distributed, as well as the most valuable.

The Terrace Mountain, at the Mammoth Hot Springs; Sulphur Mountain, near the Great Falls; Sulphur Hills, near the Pelican; the elevated, bald, and crumbling hills of the Norris, and, to some extent, other geyser basins and countless localities throughout the Park contain vast deposits of sulphur, and most of them alum, copperas, and other mineral substances in greater or less quantity, and together afford a vast field for chemical investigation, if not commercial enterprise. Some of the crystallized sulphur, apparently produced by vaporization, is almost pure enough for immediate use for pharmaceutical purposes.

HEADQUARTERS OF THE PARK.

MAMMOTH HOT SPRINGS.

In consideration of its isolation from the world, and of danger at the time from Indians, it is now fully conceded, if it was ever seriously doubted, that the location of the headquarters of the Park at the Mammoth Hot Springs, and the sites chosen for the buildings and for pasturage, are admirable for defense, convenience, and beauty; while the buildings, fences, and other necessary improvements, are well planned, constructed, and preserved. Hence, although the relative slower progress of the Northern Pacific to that of the Utah Northern Railroad in approaching their respective natural gateways to the Park may temporarily tend towards changing headquarters to the Forks of the Fire Holes and centering point of roads and places of interest at that end of the Park, still it is questionable, in the event of the ultimate opening of a railroad route up the Yellowstone, whether the relative superiority of the location for health, beauty, comfort of wintering, and grading purposes, as well as for great herding, farming, and mineral developments in the vicinity, may not render their continuation at the present site desirable and wise. But even should a change be necessary, the present buildings will be required for a long time, and are adequate as the residence of an assistant. The principal improvement necessary is the introduction into headquarters of hot and cold water, of which there is an ample supply at a proper elevation, and the routes for the carrying-pipes for which have been located, and estimates furnished of the cost of the work.

The observations of this season confirm those expressed in my last year's report upon the origin, former enormous terrace-building properties, and their present dwindling remnants, and the propriety of testing the effect of an increased supply of water from the West Gardiner River above the ancient terraces. If Bunsen's theory be true, as now appears

probable, that the deposits are only made by evaporation, and that pipes will not seriously coat nor fill internally, then a vast field is opened for the most unique, inimitably grand, beautiful, and permanent ornamentation of headquarters and surroundings of the Park that can be imagined by the most visionary dreamer of the beautiful and marvelous.

To these features may be added the leasehold value of hotel or other sites for a boundless display of portable ornamental work for sale to tourists or for display or preservation in the leading cabinets and museums of the civilized world.

BOUNDARIES OF THE PARK.

That the dedication in 1872 of the Yellowstone National Park as a heritage of wonders for the enjoyment of our people was a wise and timely act few will now question. Fortunately its boundaries as originally dedicated were approximately correct; but as the real object was to dedicate in the best possible form a mountain-girt park of unique and matchless marvels, priceless as a health and pleasure resort, and embracing as little as possible of value for other purposes, to fully accomplish this it is necessary to change somewhat the boundaries and restrict rather than extend them. I am still of the opinion, therefore, as expressed in my previous reports, and for the many and evident reasons therein stated, that the northern and western boundaries of the Park should be speedily changed so as to conform to those of Wyoming Territory. This will necessitate taking off a strip some three miles wide from the borders of Montana and Idaho Territories, which, while valueless to the Park, is valuable for other purposes. I also deem it quite likely that careful exploration will render evident the propriety of severing a like strip from the entire southern border.

While these changes will greatly reduce the area of the Park where there is nothing of value to retain, my explorations of the past season of the Sierra-Shoshone Range east of Yellowstone Lake and in the Hoodoo or Goblin regions, lead me to conclude that it is very probable the extreme drainage of the East Fork of the Yellowstone, including at least the Hoodoo regions, is outside of the present boundaries of the Park. This entire region south of Crandall Creek is probably destitute of all rich minerals, while it is one of the wildest, most precipitous, impassable, and worthless mountain ranges on the continent, valueless except for scientific exploration or as an attachment to the National Park. Hence I deem it practically important that a thorough exploration of this region be made before running the eastern boundary of the Park, with a view to learning whether it may not properly be modified or changed, if necessary, to embrace these newly-explored wonders. But if this be done the policy which has been uniformly pursued in regard to tolls on roads or bridges within the Park should be extended to that expensive and valuable portion of the road down the Gardiner, which would revert to the control of Montana, and the act of recession should contain a provision that all roads previously made within the Park or public lands of the nation shall remain forever free from toll.

CROW INDIAN TREATY.

A treaty with the friendly Crow Indians, for the cession of the mining regions within and adjacent to the present northern boundaries of the Park, prevented anticipated annoyance from that quarter during the past season, and trouble in this direction will be obviated hereafter by

the early ratification of the treaty and permanent legal occupation of the mines. These measures will, I trust, be speedily accomplished for these reasons, as well as for other reasons fully stated in my last year's report.

SHEEPEATER AND BANNOCK INDIANS.

The feeble and harmless Sheepeater Indians were the aboriginal owners and formerly the only permanent occupants of the Park, and being somewhat allied to their Shoshone and Bannock neighbors, these latter were occasional ramblers therein. Excepting Washakie's band of Shoshones on Wind River, they are all now united in the agency at Ross Fork of Snake River, in Idaho. Having faithfully adhered to the obligations of their treaty of cession, made in Washington during last winter, as well as to their promises made to me at their agency in the Ruby Valley in the spring, no trouble has arisen with them in the Park during the past season, nor is any looked for in the future; and with the adoption of the measures mentioned above, there need be little fear of Indian depredations hereafter within its confines.

REPORT OF THE GAMEKEEPER.

It is with pleasure that I refer to the report of the active and efficient gamekeeper of the Park (which will be found in the Appendix, marked A), and indorse his suggestions for the protection of the interesting and valuable animals within it. The explorations this season in the Hoodoo and other eastern portions of this region will prove so inviting to tourists that game will soon be as much exposed there as elsewhere in the Park, and unwilling to abandon these animals to speedy extermination, I cordially commend Mr. Yount's suggestion for their protection in all its confines.

While the Park remained a haunt of hostile savages, and was without roads, hotel, or other conveniences of civilization, tourists necessarily went fully armed for self-protection as well as to secure food; but with the disappearance of the necessity for carrying heavy long-range rifles, their use should be discontinued, except by agents or employés of the government, and by them only upon specified conditions. It may require years of judicious management to accomplish this to the satisfaction of border-men ever fully armed; but habits speedily change with circumstances, and mountaineers and tourists will, it is believed, soon prefer unmolested enjoyment with the rod and fly, in the splendid opportunities for trout-fishing, or perhaps with the fowling-piece rather than the heavy, cumbersome, expensive, and often dangerous long-range rifle now in use. It is believed that few of the mountaineers would long resist appeals to their national pride for the preservation and protection of the noble animals that roam through this great National Park. For my constant and urgent appeals for protection for these animals and for methods of accomplishing it, I refer to pages 11, 12, and 13 of my Report of 1877, page 10 of Report of 1878, and pages 21 and 22 of Report of 1879, but in connection with the subject I would add that there are now in the Park abundance of bison, moose, elk, deer, antelope, and big-horn sheep; besides fine summer pasturage, there are winter haunts for these animals, where, with little care or expense other than protection from wanton slaughter, they would rapidly multiply. Many of them would become domesticated and thus an interesting feature of this great domain of nature would exist, when these animals become, as will ere long be the case, extinct elsewhere on this continent. Some would,

of course be slaughtered, but judiciously, and when both their pelts and flesh were most valuable.

HISTORY OF THE PARK.

On account of the evidently increasing interest of the public in the great Yellowstone National Park, and believing that a carefully-prepared and accurate statement of its location, dedication, and routes of access, as well as reference to its aboriginal inhabitants, prominent explorers, and first buildings may prove of present and permanent interest and be of lasting value, a few pages of the report are devoted to this subject.

As partly shown by the accompanying map of the Park, and much more fully by the excellent Land Office map of the United States, the Snake River Fork of the Columbia, and Green River Fork of the Colorado of the Gulf of California (Pacific waters), and nearly all the other great rivers of that portion of the continent, including the Jefferson, Madison, and Gallatin Forks, and the Yellowstone, Big Horn, and other branches of the Missouri-Mississippi-Atlantic waters, to a great extent radiate from hot springs or spouting geysers within or adjacent to the great National Park, situated mainly in Northwestern Wyoming Territory and also embracing portions of Idaho and Montana. There can be no doubt that the modern sulphur basins, salses, hissing fumeroles, and spouting geysers are only dwindled remnants of the ancient volcanoes and vast and long-continued eruptions of lava, which, in the region of the National Park, characterized the elevation of the Great Plains and Rocky Mountain ranges from the oozy bed of a shallow ancient sea.

It is also evident that at some subsequent but remote period of time many of these mountain slopes were at an elevation of from 6,000 to 10,000 feet, covered with dense forests of timber, in size fairly rivaling those upon the Pacific coast, and that by some oscillation in the elevation of these regions, by eruptions of hot ashes, mud, and slime, like those which covered Pompeii and Herculaneum, or other all-powerful and long-recurring agencies, forests have been crushed or covered, often many hundred feet deep, by conglomerate breccias or other volcanic material.

Here erosion of the elements, or the blast, or pick and shovel of the tourist, unearth this ancient timber, which is often petrified entire into a perfect tree or log of stone; other timbers, while retaining their form, into opal or chaledony, with amethyst or other crystallized cavities, matchless in shape, color, and beauty, which, for cabinet specimens, are unequaled elsewhere in nature and unrivaled by art.

Many hot springs and mineral streams now petrify timber or coat it with sparkling lime or silica, build geyser-cones, and many beautiful forms of crystallization, but they are all clearly distinct, and mainly much inferior to those of the closing eruptive period.

This wonderful region is really less one large park than a group of smaller ones, partially or wholly isolated, upon both sides of the Continental Divide, much lower in the Park than the nearly unbroken surrounding mountain ranges. Its average altitude probably exceeds that of Yellowstone Lake, which is some 8,000 feet, or nearly a half mile higher than Mount Washington. Its few yawning, ever difficult, often impassable, cañon-approaches along foaming torrents; the superstitious awe inspired by the hissing springs, sulphur basins, and spouting geysers; and the infrequent visits of the surrounding pagan Indians have combined to singularly delay the exploration of this truly mystic land.

Although Lewis and Clarke, by ascending the Jefferson instead of the Madison or Gallatin Fork of the Missouri in 1805, crossed the Rocky Mountain divide some seventy miles west of the Park without its discovery, yet it is from a member of that early band of Northwestern explorers that we derive our first knowledge of its existence. Coulter and Potts, after their discharge in 1806, retraced Captain Clarke's return route, via the Yellowstone River and Bozeman Pass, to the Three Forks of the Missouri. They there continued to trap and hunt until Potts was killed and Coulter captured in a Blackfeet Indian ambushade below the famous Beaverhead landmark upon the Jefferson. Coulter was allowed to run the gauntlet for his life, and, being remarkably fleet of foot, distanced all but one of his pursuers, whom he pinned to the earth with his own war-lance, escaping over six miles of prickly-pear plain to some drift-wood at the head of an island in the Jefferson. Unarmed, naked, and lacerated, he, through untold dangers, hardships, and suffering, reached a trading-post on the Lower Yellowstone, rearmed himself, and returning to his Bannock friends, for years hunted, trapped, and, with relentless vengeance, fought the Blackfeet Indians.

The haunt of the main Bannock tribe was at Henry's Lake, west of the Park; that of their little Sheepeater band within it; their main buffalo range being upon the Big Horn, east of it, and doubtless with them Coulter visited the Great Falls, Yellowstone Lake, and some of the fire-hole basins and spouting geysers, and after his return to Missouri in 1810 gloried in describing them; yet, so little credence was given to his descriptions, that for many years, even long after I was first upon the Lower Yellowstone, "Coulter's Hell" was a standing camp-fire jest upon now well-known realities; but John Coulter was, without a shade of doubt, the first white explorer of any portion of the Yellowstone National Park.

In 1809 the veteran fur-trader, Henry, driven from the Three Forks of the Missouri by the ferocious Blackfeet, constructed and for a time occupied a stockade fort upon the outlet of the lake which still bears his name.

W. P. Hunt and Ramsey Crooks, in their outward route to the ill-fated Astoria, with a strong party in 1810, and also the feeble remnant of the band during their return in 1812, crossed the Wind River Range south of the Park.

The famous American mountaineers, Henry, Ashley, Sublette, and Jackson; the Scottish Campbells and Stewarts; the French Pierre, Port Neuf, and Fontenelle, and other renowned trappers and traders roamed over the regions surrounding the Park until most of them were killed by the Indians, prior to the expedition of Captain Bonneville in 1832. During that year a sanguinary battle was fought between the bloody Blackfeet and the combined bands of these fur-traders and their Bannock friends at their general rendezvous in the famous "Pierre's Hole," near the Three Tetons, and with the mountains of the Park in plain view; and yet, most strangely, in all the published reports of these famous mountaineers we fail to find a hint of the Park or its wonders.

During nearly three years of trapping and trading with the Indians by Captain Bonneville and his detached parties, in all directions from the Park, it is evident that he neither visited it nor learned its true location; for although his map of these regions is far more accurate than *any* before and *many* since, even that shows the largest mountain lake as the head of the Snake River, and hence Pacific waters, instead of the Yellowstone, which really discharges into the Atlantic; Bonneville's representation of this lake is also inaccurate in form, and is without

name or indications of the great falls, cañons, or geysers, or any of the fire-hole basins in the Park. In fact, in his only reference to the latter (Irving's *Bonneville*, page 236) he erroneously locates it upon the Stinking River (now Water) branch of the Big Horn, where the sulphur fumes from an extinct geyser basin somewhat resemble those of the Park, the basin itself, however, every way less mountain-girt and less important than any which Coulter saw within the Park.

While I have given much credence to a well-indorsed camp-fire story that one Smith, a trapper, prior to the days of *Bonneville*, had written a narrative of his explorations of these regions, and who was killed shortly thereafter by Indians, I have never as yet met with any published record of the same.*

Border legends, although often gross exaggerations, are seldom wholly false, and scores of them indicate that white mountaineers did occasionally long ago visit portions of the Park for trapping or concealment, and perhaps for both purposes. This, in fact, is proven by ancient stumps of large trees cut for breastworks and for foot-logs across the Crevice, Hellroaring, and other mountain torrents, which no experienced mountaineer would fail to recognize as the work of white men, being rounded from below in a way never practiced by any known Indians; also by a corral near Amethyst Mountain, and ruins of an ancient block-house with earth roof and loop-holes, near the grand cañon below Mount Washburn, clearly the work of unknown white men, and a cache of marten steel traps, of a peculiar form only used by the Hudson Bay trappers some fifty years ago, which were recently found along our road near the Indian arrowhead-quarry at Beaver Lake.

In Frémont's reports of his explorations in those regions in 1842-'44, he describes mountain scenery and harmless hermit Indians similar to those in the Park, but makes no mention of geysers, being probably at that time ignorant of their existence.

In 1844 James Bridger described to me personally, and as I now know correctly, the cañons of the Upper Snake River, but he had then neither seen nor obtained a correct conception of the geysers, deeming them real volcanoes. His description of the Two Ocean Pass south of the Park is now admitted to be mainly correct, and there is "more truth than poetry" in his camp-fire story of a foaming torrent, icy cold at its snowy fountain-head, and seething hot half a mile down the mountain-side, though not caused, as he boasted and perhaps believed, by the velocity of the descent, but by a crag-hidden fire-hole basin of spouting water and seething brimstone. So, also, with his famous legend of the lake with millions of beaver, nearly impossible to kill because of their superior cuteness, with haunts and houses in inaccessible grottoes in the base of a glistening mountain of glass, which every mountaineer of our party at once recognized as an exaggeration of the artificial lake and obsidian mountain which I discovered, as stated in the chapter on explorations in my report of 1878. But as this locality and that of the arrow and lance head quarry are

* Since the publication of the facts already narrated in my report of 1878, learning that the late Mr. George Gibbs was supposed to have obtained a copy of the manuscript of this narrative of the trapper named Smith, and failing, after diligent search of his valuable papers (now with the ethnological bureau, under Maj. J. W. Powell) to obtain it, I last year addressed a letter of inquiry on the subject to his brother and representative, Prof. Wolcott Gibbs, of Cambridge, Mass. From his reply, learning that he failed to find the manuscript, cordially assisted by Mr. George H. Boehmer, in charge of the international exchange office of the Smithsonian, I examined the Gibbs papers in that institution. Again disappointed, I reluctantly abandoned the search, believing that if found they would impart much interesting information relative to the Hudson Bay and other early trappers of those regions, and I leave this record of the circumstances to stimulate research for this missing manuscript.

across a sharp mountain range from where represented by Bridger and so long sought by trappers, it is not probable that he ever saw them, but that his information was derived from old Hudson Bay trappers or their Indian allies, who were, perhaps, alike interested in deceiving him as to their true location. These rumors of a mountain-girt land of wonders at the fountain-heads of the Missouri and Yellowstone so impressed Lieutenant (now General) G. K. Warren during his explorations of the Black Hills and Great Plains up to 1857, that he planned an expedition to verify them. A strong, well-equipped party, under the command of Captain (since General) W. F. Reynolds, with Prof. F. V. Hayden as geologist, and James Bridger as guide, were sent upon this expedition and spent the season of 1859 in exploring the Black Hills and Big Horn regions, but failing to cross the towering Yellowstone Range and reach its mystic lake, they wintered upon the North Platte. Efforts were renewed in the spring by sending Lieutenant Maynadier with a party down the Big Horn to again seek a pass from the east, while the chief of the expedition with the main party sought one up the Wind River from the south. Both parties failed; Reynolds by encountering a buttress-based, snow-capped mountain wall, to cross which, Bridger declared that even a crow would need to carry his grub.

Turning to the west and crossing the main Wind River divide, near the head of Green River, and failing in another effort to reach the cliff and snow encircled Park from near the Three Tetons, Reynolds abandoned the effort, and followed the old traders' route via Henry's Fork and Lake to the Three Forks of the Missouri. He was here joined by Lieutenant Maynadier, who, baffled in all attempts to reach the Park from the east, had crossed the Yellowstone in bull-boats below the Gate of the Mountains, and through the Bozeman Pass had reached and descended the Gallatin. (See Ex. Doc. 77, Fortieth Congress, first session.)

The utter failure of a two years' search for the geyser basins by such well-equipped parties, led by the most famous mountaineer guide, proves them mountain-girt and isolated from the surrounding regions, with few and difficult routes of access.

Thus baffled, the government made no further effort to explore the Park until long after gold-seeking pilgrims had visited various portions of it. Prominent among these prospectors were Bart Henderson, Adam Miller, George Houston, and C. J. Barronette around the Forks of the Yellowstone, and Frederick Bottler and H. Sprague from Henry's Lake to the Forks of the Fire Hole River. All these visits were prior to 1869, when two hunters, Cook and Folsom, explored portions of the Park, but their oral report, made to General Washburn and to others who sent them from Helena, has never been published.

Having myself, long before the Reynolds expedition, failed, as he did, to reach the Park from the east, in June, 1870, I again sought, after many years' absence from those regions, to reach it by ascending the Yellowstone above the Gate of the Mountains, accompanied by Frederick Bottler, from the Bottler ranch. Deep snows baffled our resolute efforts to cross the Madison Range to the geysers, and, when seeking to descend to the Yellowstone Valley below the Mammoth Hot Springs, Bottler was swept away in attempting to cross a mountain torrent above Cinabar Mountain, losing his rifle, ammunition, most of his clothing, and nearly his life. This mishap compelled our unwilling return from within the Park through the then nearly unknown and impassable second cañon of the Yellowstone to Bottler's, the only white ranchman at that time upon any portion of the mighty Yellowstone River. Thence I retraced

my route to Fort Ellis, published a brief account of my trip (see No. 3. of my Journal of Rambles in the Far West), and, under previous engagements, descended the Columbia to the ocean, purposing to return to the exploration the next year.

During the following autumn the Washburn expedition was suddenly organized for Park exploration. It was composed of H. D. Washburn, N. P. Langford, T. C. Everts, S. T. Houser, C. Hedges, W. Trumbull, B. Stickney, W. C. Gillett, and J. Smith. General Washburn, in command, was then surveyor-general, T. C. Everts and N. P. Langford ex-officers and all prominent and esteemed citizens of Montana Territory. They were well equipped, and at Fort Ellis were joined by Lieut. G. C. Doane and seven men; from here they followed my return route to and up the Yellowstone through its second cañon. They missed the Mammoth Hot Springs, but visited Mount Washburn, the Great Falls and Lake, returning by the Fire Hole River and Madison route to Virginia City. When among the fingers of the Yellowstone Lake, Everts lost his way, horse, arms, and provisions, and after thirty-seven days of exposure, starvation, and suffering, doubtless unequaled by any other man now living, was found by Barronette and Prichette, barely alive, upon the Black Tail, near the Mammoth Hot Springs. This is the first party of really successful explorers of any considerable portion of the Park of which we have any public record. (See General Washburn's surveyor-general's report; also that of N. P. Langford, in the May and June, and T. C. Everts's Thirty-seven Days of Peril, in the November number of the second volume of Scribner's Monthly Magazine, and Lieutenant Doane's report, Senate Ex. Doc. 51, Forty-first Congress, third session.)

The interesting letters, reports, and personal influence of the various members of this party led to Professor Hayden's interesting and valuable explorations in the wonderland in 1871. (See Professor Hayden's Geological Surveys of 1871.) Capts. J. W. Barlow and D. P. Heap also made valuable explorations, maps, and report of portions of the Park in the same year. (See Senate Ex. Doc. 66, Forty-second Congress, second session.)

During the succeeding winter Professor Hayden and his associates were very active in publishing and distributing photographic views, sketches, and other valuable information in reference to this splendid region; and in preparing, and, aided by many leading members of Congress—notably Representative (now Senator) Dawes—advocating to its passage a bill dedicating it as a health and pleasure resort for the American people under the name of the Yellowstone National Park. (For its boundaries and control by the Secretary of the Interior, see copy of the act of dedication in Appendix, marked B.)

For report of Professor Hayden's extensive explorations in the Park, see his report of Geological Surveys for 1872.

Capt. W. A. Jones and Prof. Theodore B. Comstock explored mountain passes to, and a portion of, the Park, making valuable reports and maps. (See House Ex. Doc. 285, Forty-third Congress, first session.)

In 1874, the well-known Scottish Earl Dunraven made a tour of the Park, and published an interesting narrative of the same. (See his Great Divide.)

For the Rev. E. I. Stanley's visit to the Park, see his interesting narrative called Rambles in Wonder Land in (I think) 1874.

For Secretary of War Belknap's narrative of a tour of the Park, see his report of 1875.

Capt. W. Ludlow made a reconnaissance of the Park in 1875. (See Engineer's Report published by War Department.)

For record of P. W. Norris's explorations in the Park in 1875, see Nos. 24 and 25 of his Journal of Rambles in the Far West.

Besides Moran, Jackson, Elliott, Gannett, Holmes, and other justly famous artists who have at various times accompanied Professor Hayden's and other expeditions, J. Crissman, H. B. Calfee, Marshall, Fouche, and other photographers have at various times visited the Park, making and widely disseminating interesting views of the great falls, geysers, hot-spring terraces, and other wonders of the Park.

During all these years of exploration and research, so far as I am aware, the wisdom of Congress in promptly dedicating the National Park has never been seriously questioned; nor has its size, appropriate control by the Secretary of the Interior, and his rules and regulations for its protection and management, been deemed objectionable. Hence it is not what Congress has done, but what it so long neglected to do; not the dedication of a lofty mountain-girt lava region destitute of valuable minerals, isolated and worthless for all else, but matchless and invaluable as a field for scientists and a national health and pleasure resort for our people; but rather the failure to make moderate appropriations for its protection and improvement until leases could be made to assist in rendering it self-sustaining, which compelled its first superintendent, N. P. Langford, to abandon all efforts for its protection against long-allowed destructive forest fires, wanton slaughter of its interesting and valuable animals, and constant and nearly irreparable vandalism of many of its prominent wonders. So uniform was the testimony of the civil and military officers of the government, as well as of the American and European scientists and tourists who visited the Park, and so strong their appeals to the nation for its protection, or at least the sending of a commissioner or an agent specially empowered to investigate and report the facts, that among the early acts of the present honorable Secretary of the Interior was my appointment as superintendent of the Park, specially instructed to again visit it and report the facts as I should then find them for the information of Congress. But as to funds for salary, or even expenses, none were furnished or promised; but I was left to rely upon Congress to make provision to properly pay for the performance of duties pointed out and positively required of the Secretary of the Interior in the act dedicating the Park. This will, I think, appear clearly evident by perusal of the act of dedication, the rules and regulations of the Secretary of the Interior, and my appeal to the mountaineers as published in No. 62 of the Norris Suburban, several hundred copies of which were gratuitously distributed throughout the regions adjacent to the Park during the spring of 1877. (These documents will be found in the Appendix, marked A, B, and C.)

Under these circumstances, and without pecuniary aid from any department, association, or individual, I proceeded, via Bismarck, Forts Buford and Keogh, the Custer battle-field, and Gate of the Mountains upon the Yellowstone to the Park. After visiting the most important of its known wonders, and exploring others, as well as an important out-off trail route of approach to the Park (which from being through a portion of the Crow Indian Reservation is still unopened), I started to descend the Yellowstone, but meeting General Sherman I returned with him to Tower Falls. Here, by the breaking of a saddle-girth, I was unhorsed and too seriously injured to proceed with the General or even to return home, except by descending the Yellowstone in a skiff from above the Gate of the Mountains, which course I adopted.

During my return home the hostile Nez Percés made a raid in the Park, which was so sudden and unexpected that General Sherman and his slender escort narrowly escaped capture. Several tourists, however, then in the Park, were killed, wounded, or captured. Among these was Professor Dietrich, whose body was riddled with bullets while he was standing in the doorway of the McCartney cabin at the Mammoth Hot Springs. In addition to the tourists known to have been in the Park at this time, there were also many miners from the Black Hills region, some of whom no doubt met death at the hands of these savages, as evinced by a number of skeletons of men and horses, and fragments of blankets and other camp outfit found by myself and others near the Indian line of retreat. This was by way of the best ford upon the Yellowstone River, at the Mud Volcano, thence by the East Fork and Cache and Crandall Creeks.

The selection of their camp sites, and their rude but effective fortifications, their valor in conflict, and their omission to scalp the dead or maltreat the living who fell into their hands, indeed, their conduct in all respects, proves that the Nez Percés are not wanting in courage, chivalry, or capacity, and that they are foemen not unworthy of the noted military officers, Howard, Miles, Sturgis, and others, who have battled against them.

The facts and suggestions in reference to the Park, as submitted by myself to the honorable Secretary of the Interior, were incorporated in his Report of 1877 (part first, page 837), and also deemed by him worthy of publication in pamphlet form. (See Report of the Superintendent of the Yellowstone National Park for 1877.)

After a long and careful investigation of the whole subject, and in consideration of the written opinions of prominent scientists and explorers of our country, the cautious and prudent Congress of this period, at its first session, with flattering unanimity, made an appropriation of \$10,000 for the protection and improvement of the Park.

For a detailed statement of the improvements made with a portion of these funds, during the Bannack Indian raid in the summer of 1878, see the superintendent's report for that year.

For accounts of the explorations and researches, in the Park, in 1878, of the assistants of Professor Hayden, Messrs. Stevenson, Holmes, Gannett, Wilson, and Peale, see Hayden's Geological Report for that year. During the year just mentioned, among other visitors to the Park, were General Nelson Miles, who, after a bloody and decisive conflict with the Bannacks, made its tour, with Colonel Baker and other officers, and Mrs. Miles and a party of ladies. Besides these, there were, as visitors to this wonder-land, Lord Stanley, the German Colonels Shutz and Kaster, Colonel Berthold, with a party of Utah Northern Railroad engineers, and Rev. Dr. Wayland Hoyt, of Brooklyn, N. Y.

During the season of 1879 there were no geological or scientific explorations within the Park. It was visited, however, by Generals Sackett and Hazen, and other American, as well as by several European, military officers; and also by Messrs. Thomson and Cadwalader, of Philadelphia, Buckland of Ohio, and other prominent railroad officials, and Professor Geike, of Scotland.

During this year (1879) there were no Indian raids, but the resident Sheepstealers, with small bands of horse-stealing Bannacks and Shoshones, rendered such caution necessary in selecting and guarding camps and animals as seriously to retard as well as to increase the expense of improvements in the Park.

Besides substantial buildings for headquarters of the Mammoth Hot

Springs and a small house in the Upper Fire Hole Basin, several important roads and trails were constructed. (For details of these improvements as well as for an exhibit of expenditures under the appropriation of \$10,000 for Park purposes for that year, see superintendent's report of 1879.)

At the pressing recommendation of the honorable Secretary of the Interior, the appropriation for the Park for the fiscal year 1880-'81 was increased to \$15,000, thus justifying the employment of a gamekeeper, whose report has been previously referred to.

Notwithstanding the very unfavorable season and consequent bad state of the roads and trails within and adjacent to the Park, nearly 2,000 tourists visited and safely returned therefrom during the past season. Of these, prominent in position and reputation, were Secretary Schurz, General Crook, Colonel Staunton, Hon. Jacob M. Thornburgh of Tennessee, and others, who accompanied the honorable Secretary to the Park via the Henry's Lake route from the Utah Northern Railroad. General Crook, Webb Hayes (son of the President), and others, after viewing the geysers of the Fire Hole Rivers and the Yellowstone Lake and Falls, returned as they came. The honorable Secretary, his nephew, and others of his party, after making a rapid but thorough tour of the leading points of interest within the Park, left it by the elevated and difficult trail-route to Clark's Fork just in time to escape a severe mountain snow storm. Among other prominent personages who visited the Park during the past season were General Davidson and lady, of Fort Custer, Colonel Alexander, of Fort Ellis, with their escorts and retinue of friends. Among the civilians were the Hon. John McNulta and lady, of Illinois; the famous traveler and guide-writer, Mr. Robert Strahorne, and lady, of Omaha; Captain John Burns, the mountain trapper and journalist, from the Black Hills; Mr. Majors, of Utah; Mr. Butler and other members of the Crook party; a brother and nephew of General Nelson A. Miles, and doubtless many others whom I regret to have failed to meet because of my long absence in the exploration of the Yellowstone Lake and Cañon and the Hoodoo region.

Doubtless many were somewhat disappointed in the state of the roads and trails, finding, as I have ever sought to inform the public, that, while the National Park is truly the peerless wonder-land of earth, it is also one of the largest, most elevated, and mountainous, as well as far the most humid, densely timbered, and difficult in which to construct or maintain roads or trails, of all our great mountain parks. Since the first dollar ever furnished by the nation for the protection or improvement of this heritage of wonders was expended, in August, 1878, I have deemed it more important to construct buildings for defense of the government property from the frequently recurring and ever-threatened Indian raids, and to explore the proper routes for permanent use and open all possible of them as well as the limited time and means at my command would allow for immediate use, than to hazard the loss of government animals, outfit, and probably valuable lives by Indians, or the construction of a few miles of fine coach-road, leaving the remainder of the Park as I found it—mainly an unexplored pathless region, crags, and forests. I deem the roads and trails as I have represented them—passable, most of them convenient, and portions of them excellent. Few residents of those regions find difficulty in traversing any of the roads with the teams and vehicles in common use there, but many of the grades and causeways neither are nor are claimed to be yet prepared for the use of heavy broad-track military wagons for mule-trains, such as were used upon several of them during the past season.

ABORIGINES OF THE PARK.

[[Although the Crow Indians upon the north, the Shoshones upon the east and south, and the Bannocks upon the west might have, during the brief summers, traversed the few difficult passes to the Park, there is little evidence to show that they did so. It is probable that they were deterred less by these natural obstacles than by a superstitious awe concerning the rumbling and hissing sulphur fumes of the spouting geysers and other hot springs, which they imagined to be the wails and groans of departed Indian warriors who were suffering punishment for their earthly sins.

The only real occupants of the Park were the pigmy tribe of three or four hundred timid and harmless Sheepstealer Indians, who seem to have won this appellation on account of their use of the flesh and skin of the big-horn sheep for food and clothing, and their skill in hunting these animals amid the cliffs, crags, and cañons of the snowy mountains.

Whether these people are the remnant of some former race, as the legendary wild men of the mountains, or are descendants of refugees from the neighboring Bannock and Shoshone Indians, is not known, although their own traditions and the similarity of their languages and signals indicate a common origin, or, at least, occasional intermingling.

These Sheepstealers were very poor, nearly destitute of horses and fire-arms, and, until recently, even of steel or iron hatchets, knives, or other weapons or implements. The stumps and the ends of the poles for lodges, wickeups, and coverts for arrow-shooting, from having been cut by their rude obsidian or volcanic-glass axes, appear not unlike beaver-gnawings.

On account of this lack of tools they constructed no permanent habitations, but as evinced by traces of smoke and fire-brands they dwelt in caves and nearly inaccessible niches in the cliffs, or in skin-covered lodges, or circular upright brush-heaps called wickeups, decaying evidences of which are abundant near the Mammoth Hot Springs, the various fire-hole basins, the shores of Yellowstone Lake, the newly explored Hoodoo region, and in nearly all of the sheltered glens and valleys of the Park.

Within or near these haunts, and notably at a great hot spring upon the Gardiner River, at and below the Sheepstealer Cliffs, which are above the Mammoth Hot Springs, and also in the Hoodoo, Pelican Creek, and Yellowstone Lake regions are found rude stone or decaying timber breastworks for temporary defense from man or animals, but all the substantial bulwarks found are those made by the Nez Percé and Bannock Indians during their recent raids.

To these latter Indians may be attributed the recent graves as well as burial cairns within the Park; but as the Sheepstealer Indians did not place their dead upon branched trees, or upon scaffolds, like the brown Indians of the Great Plains, graves or cemeteries of this people may yet be found.

Other traces of this tribe are found in the rude, decaying, and often extensive pole or brush fences for drive-ways of the deer, bison, and other animals to the arrow-coverts, in the cañons or in the narrow passes between them, for slaughter with their rude lances and obsidian-headed arrows.

For want of proper tools, but little timber was cut, and these drive-ways were mainly constructed of the ever-abundant dead and fallen saplings, with the roots attached, which, from their pitchy properties, long outlast the trunks and branches, thus enabling an experienced mountain-

eer to trace these drive-ways a long distance, even in groves of thrifty timber.

One of the most accessible of these drive-ways is upon the southern cliff of the impassable cañon of the West Gardiner, having its evidently more recent arrow-covert within point-blank range of its verge overlooking Rustic Falls.

From this covert there are traces of one wing that skirted the valley toward Swan Lake, and of another that wound through groves of pine at the base of Bunsen's Peak, far toward the Sheepeater Cliffs, upon the Middle Gardiner, nearly two miles distant.

Countless drive-ways and coverts in every stage of decay are still found in favorable localities throughout the Park, and are often crossed unobserved by ordinary tourists. In fact, these Indians have left fewer enduring evidences of their occupancy than the beaver, badger, and other animals on which they subsisted.

HABITATIONS OF WHITE MEN WITHIN THE PARK.

A list of the habitations of the early white rovers or explorers of these regions is here given, as well as those constructed in more recent times.

1. An earth-roofed, loop-holed cabin, 16 by 20 feet in diameter, discovered by Frederick Bottler, and visited and described by me in 1878, was almost entirely destroyed by the great fire of 1879. It was situated between Antelope Creek and the Grand Cañon, below Mount Washburn. Nothing is certainly known of its age, or of the character of its builders, but the advanced decay of the timber of which it is constructed, its fallen roof and generally dilapidated condition, indicate that it was the work of Hudson Bay or other trappers forty or fifty years ago. In corroboration of this theory is the absence of port-holes opening alike each way, as usual and proper in the now general use of fire-arms by Indians. This arrangement would have allowed a warrior armed with bow and arrows, by stealthy maneuvering in darkness through the timber, to use his weapons in silence and within point-blank range in front with terrible effect, but which was in trapper days prevented by using loop-holes, each open but one way, but alternating in direction, thus preventing a Bowman from reaching a dangerous position before exposed to loop-holed cross-fire.

2. A log house upon the point just above the Forks of the Yellowstone, built by C. J. Baronette in the spring of 1871. This was soon burned, presumably by Indians, and a second one, now in ruins, constructed on its site.

3. Earth-roofed log house in the ravine flanking the Mammoth Hot Springs, built by J. C. McCartney and Henry Hor in the summer of 1871, with which have been subsequently associated other houses, as well as bath-houses, some of which are shingle-roofed.

4. An earth-roofed log house, and also a cabin bath-house, built by M. McGuirk in 1871-'72, near the Mammoth Hot Springs, and which still bear his name.

5. Earth-roofed cabin at Toppin's Point, near the foot of Yellowstone Lake, built by Captain Toppin in 1875.

6. Fine shingle-roof block-house of hewn timber, with a balcony and three wings, and surmounted by a gun-turret upon a commanding natural mound fronting the Mammoth Hot Springs, built by the superintendent of the Park for use as headquarters in the summer of 1879. (See frontispiece.)

7. Earth-roofed cabin in a small grove upon the bank of the Fire Hole

River, between the Castle and Bee Hive Geysers in the Upper Fire Hole Basin, built by the superintendent of the Park in the fall of 1879.

8. Block-house, barn, blacksmith shop, and bath-house at the Mammoth Hot Springs, built by the superintendent of the Park during the summer of 1880.

9. Earth-roofed log house and barn, for the Riverside mail-station at the forks of the old cañon, and the terrace roads below the cañon of the Madison, upon the road to Henry's Lake, built by Marshall and Goff during the summer of 1880.

10. Fine-shingle roofed mail-station and hotel, with barn and out-buildings, upon a cold rivulet at the foot of the cliffs just west of the Forks of the Fire Hole Rivers, built by Marshall and Goff during the summer and fall of 1880.

11. Rude, earth roofed cabin and barn at the Norris Fork mail-station, built by Marshall and Goff in the fall of 1880.

12. Earth-roofed cabin for gamekeeper, upon the foot-hill terrace south of the confluence of the East Fork of the Yellowstone and Soda Butte Rivers, built by the superintendent of the Park and its gamekeeper late in the fall of 1880.

These, with several miners' cabins, and perhaps a Chilian arrastra upon the Montana and Crow Indian Reservation portion of the Park are all the buildings that have been constructed by white men within the Yellowstone National Park, of which I have any knowledge, down to the close of the year 1880.

WATER-CRAFT OF WHITE MEN.

1. The Anna (so named by the members of the Hayden expedition, in honor of Miss Anna Dawes, the accomplished daughter of Senator Dawes, of Massachusetts, who had been one of the most zealous and efficient advocates of the dedication of the Park to national purposes, and who has since proved his interest in all efforts for its protection and improvement) was a small but serviceable canvas boat, and, under the skillful management of Messrs. Holmes, Stevenson, and others of the Hayden expedition, proved valuable in the exploration of the Yellowstone and Shoshone Lakes during the season of 1871.

2. The Toppin, a small sail-boat of green, whipsawed timber, built by Captain Toppin at his cabin, near the foot of Yellowstone Lake, in the summer of 1875, and which, after perilous service during a small portion of the seasons of 1875 and 1876, was dismantled, abandoned, and finally lost.

3. The Explorer, so called by my own party, was built by the Hoffer Brothers, at Toppin's Point, during the summer of 1880, and was some 20 feet long, 6 feet wide, and 2½ feet deep. Loggy and clumsy, it required skillful management and ceaseless labor to keep her in order; but with her I succeeded in exploring the lake and its near tributaries to the rapids. Finally, however, she was wrecked, and I left her battered hulk near the point where she was built.

I saw a rude canoe at the lower rapids of the Upper Yellowstone, and probably others have been used by both Indians and white men, but the above list embraces all the boats that, to my knowledge, have buffeted the blue waters of this mystic lake.

BRIDGES.

The one constructed in the spring of 1871, by C. J. Baronette across the main Yellowstone River, just above the forks, and over a dangerous

rapid and cañon, and one that cannot be avoided, was dismantled and partially burned by the Nez Percé Indians in 1877. It was repaired, however, by Baronette, myself, and others in 1878, but was always considered unsafe, and in the spring of 1880 was replaced by a substantial structure upon the old site. The necessity of reaching this, their only route of access in the absence of a safe ford upon the Yellowstone, led C. J. Baronette and J. W. Ponsford to construct the latter, which can be purchased by the government at less than its cost or value.

These are the only bridges that are known to have been constructed across the Yellowstone River in its course of many hundreds of miles.

In connection with road and trail building, I have constructed bridges upon all the branches of the Gardiner River, most of those of the Gibbon, also Tower Creek, Cascade, and other creeks, near the Great Falls of the Yellowstone and other localities, deemed unnecessary to here mention.

ANIMALS OF THE PARK.

BISON OR MOUNTAIN BUFFALO.



Bison, so called, in the Park, are somewhat smaller, of lighter color, less curly, and with horns smaller and less spreading than those of the bison that formerly inhabited the great parks of Colorado. They have also smaller shoulder humps, and larger, darker brisket wattles. They differ materially from the buffalo of the Great Plains, being more hardy, fleet, and intelligent; their hides also are more valuable for robes, as they are darker, finer, and more curly; and these animals are, in all probability, a cross between the two varieties just mentioned.

There are about three distinct or separate herds of bison within or adjacent to the Park.

The first, numbering about two hundred, pasture in summer in the valleys of the Crevice, Hellroaring, and Slough Creeks, and the mountain spurs between them, descending, with the increasing snows, to winter in the deep, sheltered grassy valleys of the East Fork of the Yellowstone and Soda Butte, and as the snows melt, accompanied by their young, returning to their old haunts.

The second, numbering over one hundred, summer in the elevated and abruptly-broken, little-known section of the Park, extending from the Hoodoo region to the Grand Cañon, and from Amethyst Mountain to Pelican Creek, near the foot of the Yellowstone Lake, and winter occasionally upon the East Fork of the Yellowstone and on Pelican Creek. Their other winter haunts are unknown.

The third herd, numbering about three hundred, roams in scattering bands. This season they were discovered upon the Madison Plateau and Little Madison River. Their winter haunts are unknown, though it is probable they are on the Pacific side of the Continental Divide, and, if so, they are not permanent occupants of the Park, and are therefore likely to be slaughtered by advancing settlers.

These animals, but little smaller than our common cattle, and with flesh quite as palatable, are easily domesticated. I have always carefully protected them from wanton slaughter during the deep snows of winter and when with their young in the spring, at which times alone they require such protection, being at other seasons the most keen of scent and difficult of approach of all mountain animals.

MOOSE.

Three of these animals were seen during the past season near the Lake of the Woods, and a few others in the various Fire Hole Basins. Their main haunts are in the densely timbered, swampy region around the various fingers and the thumb of the Yellowstone Lake. They also frequent the boggy inlets of Shoshone, Lewis, and Heart Lakes and the Snake River regions to the Tetons without the Park, but nowhere are they numerous. The boggy and inaccessible nature of their haunts renders these large and majestic animals difficult of capture, and on account of its scarcity their flesh is the more highly prized. Any attempt at their domestication must begin with inclosing them in some secure place.

ELK.

This animal is one of the largest, most beautiful, interesting, and valuable of those that inhabit this continent, and, so far as I have any knowledge, in no part of the United States were they ever found of greater size, symmetry of form, stateliness of antlers, or in greater number than in the great National Park at the period of its discovery in 1870.

As stated in my first report, at least 7,000 of these valuable animals were slaughtered between 1875 and 1877 for their hides, or perhaps for their carcasses, which were stripped and poisoned for bear, wolf, or wolverine bait. Since the first appropriation, however, for protection of the Park in 1878, notwithstanding the numbers since killed by our laborers, as well as by numerous tourists and raiding Indians, they have not seriously diminished, and but for the unprecedented severity of the past winter would have greatly increased; their increase hereafter, however, is assured if properly protected. They are inoffensive and harmless, and frequent all portions of the Park, often high up amid the mountain snows in summer, and in the most sheltered valleys in winter, in herds of a hundred or more. While the horns of these animals in the Park are, as elsewhere, unusually long, spreading, and symmetrically branched, there are many and remarkable exceptions. Some have lobed branches extending downwards, caribou-like, in front of the face; the horns of others are short, flat, and lobed, similar to those of the moose, while still others have horns both lobed and branched.

A specimen pair of horns, which I brought from the Park in 1878, is doubtless the heaviest ever seen in Washington. They are not only lobed and branched, but otherwise so notably peculiar in form as to lead me to inquire (1) are the animals to which this characteristic belongs a cross between the moose and the elk, though there is nothing else in the appearance of the animal to indicate this? or (2) is this phenomenon only a freak of nature? or (3) are the animals producing these wide horns really a subspecies of the elk? The careful consideration of naturalists is invited to this subject.

WHITE-TAILED DEER.

These animals do not differ essentially from those of the Atlantic States in size, color, horns, or habits. They usually frequent the densely timbered valleys and foot-hills, are more shy, sharp-eyed, and fleet, and less migratory than the black-tailed variety.

BLACK-TAILED DEER.

This is essentially a mountain animal, choosing the broken foot-hills or terraced slopes for pasturage and rest, and is difficult of approach ex.

cepting from above. It is frequently called mule-deer by tourists, and is so named in museums, though incorrectly, I think, since, while there are no two varieties of the deer family, in my opinion, more dissimilar, none of the latter inhabit the Park.

PRONG-HORNED ANTELOPE.

The National Park is, as a rule, too moist and thickly timbered to be a favorite resort of antelope, but they were once numerous in the open valleys of the Upper Gardiner River the open grassy region thence to the Forks of the Yellowstone, and up its East Fork to the Soda Butte, as well as on the main stream between the Great Falls, around the Sulphur Mountain westward to Mary's Lake, and in the Madison Valley. No other animal has suffered such severe slaughter, not alone within the Park, but upon the great plains, below the Gate of the Mountains, and upon the Yellowstone, where in their migrations they were wont to winter.

BIG-HORN SHEEP.

Although the web-footed, snow-loving white sheep, or Rocky Mountain goats are numerous in many of the adjacent snowy regions, I have never seen one within the Park, but the true big-horn sheep are abundant on all the mountain crests, as well as on their craggy spurs and foot-hills throughout the Park, which they never leave. Their habits and habitats tend to their preservation, which can, however, be better assured by a little effort and a small outlay.

BEARS.

The mountain men of this region believe that in the Park there are at least six varieties of the bear tribe, besides the long-tailed mud bear, or wolverine.

Grizzly bear.—The hog-back, or real California grizzly, with a mane upon the shoulders, is one of the largest, most powerful, ferocious, and dangerous animals upon the continent, but is less numerous than some other varieties within the Park. Specimens often occur of incredible size. At times one is met with which, when erect on its haunches—the customary position when looking for an enemy—will overtop in height a man on horseback. With one blow of its fearful fore paw and claws this animal is able to disembowel and kill any other animal of this region. One which I shot near Beaver Lake in the fall of 1879, after he had killed a valuable horse, was certainly heavier than any one of the more than fifty horses in our band. From his carcass thirty-five gallons of oil were obtained, and his skin, now in Washington, after being trimmed and dressed is still 8 feet 6 inches long (exclusive of the tail) and 6 feet 6 inches wide. Though but few larger than this have been taken, many but little inferior in size have been killed by different members of our parties. They seldom fail to cover with decaying logs, rubbish, or stones an elk or other animal they may kill, remaining near the body or returning nightly to it, as though a tempting dessert to their meal of grasshoppers, roots, and berries; for, human-like, they enjoy a mixed diet, though not so dainty as man in regard to its kind or quality. Although, save in defense of these carcasses or of its young, this bear seldom provokes attack upon man, it invariably resists one, and if wounded usually charges furiously, either to its own death or that of its foe, and not infrequently both. Indeed, it may truly be said to be the mountaineer's most dreaded foe.

Silver-tipped bear.—This animal is nearly destitute of a mane, and is somewhat smaller, less powerful and ferocious than the true grizzly;

moreover its coat of hair is much longer than the latter's, and is tipped at the ends with a glistening, silvery white; hence the name.

Cinnamon bear.—This is so called from its reddish-brown color. It is somewhat longer and more slender than the smut-faced bear, and nearly his equal in audacious ferocity.

Smut-faced bear.—This is a still smaller animal, with a brockled, impish-looking face—a true indicator of the character of the beast. It is the most meddlesome and pugnacious of the bear family.

Black bear.—This animal in the Park only differs from those of the East in his greater size and the greater length and fineness of his fur, and is as elsewhere, either wild or domesticated, uniformly a less ferocious animal than any of the above-described species.

"Silk bear."—This provincialism is the only designation I have heard applied to this smallest and rarest variety of the bear family. The few of which I have personal knowledge were found near the upper limit of timber, engaged in biting, in order to more easily break off for food, the cone-laden boughs of the piñon pines. They were all very fat, and had a coat of glistening black fur, fine and of extra length, rendering them more valuable than any of the species of the bear family.

All of these short-tailed varieties of bear hibernate in hollow trees, in caves, or more frequently in rude wickeups, amid the dense evergreen declivities of the mountains, to which they retire early in winter, and remain until the accumulated snows thaw in spring, when they scramble out, often very lean, and always tender-footed, but soon recruit strength by devouring roots and mountain moles at the nearest slopes clear of snow. Few mountain scenes are more ludicrously interesting than that of half a dozen bears, of assorted colors and sizes, engaged in the sport of catching the burrowing mole just below some melting snow-drift upon the steep and slippery mountain side. In ignorance of their mode of making details for duty, I can only say that it seems to be the especial task of one of each party to pull up the sage-brush, thereby unearthing the moles; the rest of them, in their efforts to catch and eat them, often falling pell-mell over each other, like Chippewa Indians engaged in a game of Lacrosse. A variation of this sport is occasionally caused by a shower of explosive bullets from the repeating rifle of a grim mountaineer, perched unseen upon some overlooking snow-field, cliff, or tree-top.

Wolverine, or long-tailed mud bear.—This animal, although considered a variety of the bear family, does not hibernate. It has a long tail, differing in this and other marked characteristics from other varieties; in fact, this audacious trap and camp plunderer seems in size and form, as well as in color, a strange blending of the black bear, the badger, and the coyote. In character, also, it combines the rapacious greed and pugnacity of all these animals with the Asiatic jackal's craving for carrion. His chosen haunts are the most densely timbered foot-hills of the mountains, where he is ever ready to steal what the bear, wolf, or lion slaughters. His extremely heavy fur, long outer hair, and thick, firm, and badger-like skin, seemingly much too large for him, allow him to squirm his body out of the jaws of nearly every other animal; and to these peculiar advantages for defense are added teeth and claws unrivaled for attack. Unlike other carnivora, their teeth do not puncture but lacerate, and, chisel-like in their powerful jaws, smoothly sever skin, bone, and tendon, inflicting such fearful wounds that most animals prefer relinquishing their game to hazarding combat.

MOUNTAIN LION OR COUGAR.

These animals are much larger, coarser-haired, and more ferocious than the animal known as the eastern panther, and during my first

explorations in the Park were exceedingly numerous and troublesome, less, however, from actual attacks upon our men or animals than by their sudden terribly sharp and prolonged screams, which reverberated in frightful intensity around our evening camp-fires in the deep and crag-hidden mountain defiles. This tantalizing tendency to start false Indian alarms and stampede the animals has led to persistent efforts of the mountaineers, with rifle, trap, and poison, to exterminate them, and so successful have their efforts proved that now the comparatively few survivors usually content themselves with slaughter of deer, antelope, and perhaps elk, at a respectful distance from camp.

WOLVES.

The large, ferocious gray or buffalo wolf, the sneaking, snarling coyote, and a species apparently between the two, of a dark-brown or black color, were once exceedingly numerous in all portions of the Park, but the value of their hides and their easy slaughter with strychnine-poisoned carcasses of animals have nearly led to their extermination.

FOXES.

Foxes are numerous and of various colors, the red, grey, black and the cross varieties (most valuable of all) predominating in the order named.

SKUNK.

In no region have I found these animals more numerous, audacious, or odoriferous than in the Park, and though I have no proof of their tendency to rabies, as is the case with those of Kansas and the Indian Territory, I have an instinctive dread of them. Hundreds of them were slaughtered before we could sleep peacefully at the Mammoth Hot Springs, and they are such an intolerable nuisance around old camping-places that tourists often slaughter several of them, and thoroughly permeate the atmosphere with their abominable stench, before they are able to secure repose.

BADGER.

These animals are similar, if not, indeed, identical, with those of the East in appearance and habits, and are numerous in most of the valleys and terraces of the Park, but are less abundant than is indicated by their countless burrows, which are annoyingly evident to horsemen long after their abandonment.

ROCK DOG.

The animal thus called, somewhat abounding in the Park, is similar in appearance and habits to the Eastern woodchuck or ground-hog, but much smaller, and utters a different cry of alarm while disappearing in its burrows amid the rocks.

PORCUPINE.

This animal is of an extraordinary size, and is occasionally found in the timbered portions of the Park.

RABBITS.

The jack-rabbit of the sage-brush plains is only found in the limited areas of that pestiferous shrub, but the large, web-footed, slit-lipped hare, gray in summer and white in winter, is simply numberless in the tangled thickets throughout the Park. Another variety, similar to the

cotton-tail, or common rabbit of the East, is also but only occasionally seen; while the plaintive notes of a smaller variety, called the cony, are often heard amid the debris of snow-slides or avalanches around the elevated timbered foot-hills of the mountains.

RATS.

There are no prairie-dogs within the Park, but the barking sedge-rat, which is somewhat similar in appearance to the prairie-dog, and burrows extensively, though not in towns, is numerous. So also is a species of long-eared and hairy-tailed mountain rat.

MICE.

Long-eared mice are here countless, and exceedingly troublesome around the camp and in the cabin.

BURROWING MOLES.

But few of the tourists who have traversed much of the Park on horse-back will soon forget the annoyance caused them by the countless loose hillocks and hidden burrows of this seldom-seen but ever-industrious animal, in the fertile valleys as well as in the sage-brush-covered foot-hills and on the terraced slopes of the mountain sides.

SQUIRRELS.

The only squirrel at all plentiful in this section is of a dark-brown or nearly black color, but not otherwise different from the red squirrel of the East.

CHIPMUNKS.

These are very plentiful, but in size and spotted color resemble the young of this animal in the East.

BEAVER.

Few regions, even less elevated, are so favorable as a haunt for the sagacious beaver or are so fully occupied by it as the National Park, which is one of the largest, as well as one of the most densely timbered regions of North America. Well supplied with rivulets invariably bordered with willows, and having numerous creeks of cold water, it also has countless geyser and other hot-spring outlets with a flow of tepid water as well as a surface elevation alike remarkably uniform. These outlets, relatively clear of ice, afford unusual advantages for burrow habitations in their banks, or for the construction, in their sloughs, of the ordinary two-story brush-and-turf houses of these animals; the sloughs and streams being used as canals for floating their winter food supplies of brush and small timber, dams being far fewer and smaller here than are usually necessary elsewhere. Unmolested by man, who is ever their most dangerous enemy, the conditions here mentioned are so favorable to their safety that soon they would construct dams upon so many of the cold-water streams as literally to flood the narrow valleys, terraced slopes, and passes, and thus render the Park uninhabitable for men as well as for many of the animals now within its confines. In consideration of this I have not seriously interfered with the trappers who have annually taken from the Park hundreds, if not thousands, of the valuable skins of these animals, without payment for the same—a custom, however, which should not be permitted to continue, since some

revenue should be derived by the government from these furs. A law should therefore be enacted or some regulation prescribed with a view to this end; but without a small police force it would be difficult to enforce any restriction in this respect.

OTTER, MINK, MUSKRAT, ETC.

Neither otter, mink, nor muskrat are numerous in the Park; nor are marten, sable, or ermine plentiful. The skins, however, of these animals, as well as those of the beaver and other animals that are obtained, are generally among the most valuable of their kinds, and, owing to the isolation and rigorous climate of the Park, are never out of season.

BIRDS OF THE PARK.

Eagles, of the usual mountain varieties, are common throughout the Park, and especially about the Yellowstone and other lakes. A very large black variety haunts and raises its young upon the inaccessible and tottering pinnacles of the eroded cliffs along the Grand, Gardiner, and other cañons, and is particularly numerous and audacious in the Hoodoo labyrinths.

This bird hovers about and terribly annoys the big-horn sheep to pick up the lame or wounded. In one instance it caused a lamb to fall from a towering cliff and thus secured a repast below; but from my position I was unable to observe whether the lamb was frightened from its place on the cliff, or hurled off after being crippled by the eagle's talons, breast, or wing. I incline, however, to think the latter was the case. It is also the opinion of Mr. Adam Miller, a most experienced mountaineer. On another occasion, when in company with this mountaineer, I experienced quite a lively time in saving from a flock of these eagles an antelope which we had shot on the East Fork, the birds only leaving the game after we had killed several of their number.

The great bald-headed turkey-buzzard or North American vulture will soon find a carcass in any portion of the Park, aided by their smaller, more numerous, and audacious friends, the raven.

The latter bird is here often called the crow, but erroneously, as there are few if any crows inhabiting these regions.

Blackbirds are countless in summer on the borders of lakes and streams.

Swan, pelican, geese, and brant are plentiful in all the streams and lakes of the Park, and hatch their young in vast numbers, notably near the mouths of the Upper Yellowstone trail and Pelican Creek tributaries of the Yellowstone Lake.

Ducks of several species are also found and in countless numbers, and hatch around the resorts of geese and swan as well as in the Fire Hole Basins. In these last-mentioned localities some of them remain late in autumn, if not indeed during the winter, as I saw them amid the dense fogs of the Norris Geyser Basin late in November of 1879, and on the 16th of November of this year I shot a fine one in the warm reservoir, at the Mammoth Hot Springs, when the thermometer ranged 10 degrees below zero.

Sage-hens or cock of the plains are sparingly found in the open portions of the park.

Pheasants, somewhat smaller and of a darker plumage than the drumming-partridge of the East, frequent the densely-timbered foot-hills of the mountain ranges.

The fool-hen variety of the grouse are numerous around the margins of hot springs, near the permanent snow-fields, and other varieties are abundant in lower elevations throughout the Park, affording fine sport and delicious food for the health and pleasure-seeking tourist.

Sand-hill cranes sound their morning reveillé in trumpet-tones from the Fire Hole Basins and marsh-bordered tepid-water ponds.

Hawks of various kinds by day and owls by night, prey upon the rabbits, moles, and grouse, as well as upon the chattering jack-daw and the gaudy blue-jay, the camp-pest of the mountains, there called whistling-bob.

FISHES OF THE PARK.

No peculiarity of these regions is better established than that of the presence of long, slender white worms in the intestines and flesh of the countless large and beautiful trout of the Yellowstone Lake, named by Professor Cope *Salmo pleuriticus*. All the trout of its cold-water tributaries below contain them, but not those above the first rapids; also the main Yellowstone above, but not below its first falls, as I have established by frequent examination of specimens of this fish. This clearly indicates that the cause of the presence of these worms exists in the lake; further than this, nothing has been established with regard to this phenomenon. My own theory of some years ago, as to the larvæ of the innumerable flies from the warm-stream tributaries (and well known to be devoured by the trout) hatching in the stomach of this fish, and the numerous other theories that have been advanced, have none of them proved to be correct. Can the cause be due to quantities of minute vegetable fragments which adulterate and discolor these otherwise clear, pure, cold waters, and, often thrown by the waves into windrows along the rocky shores, temporarily discolor them? I think not, since Lake Abundance, Trout Lake, and many other waters proverbial for excellent trout, are also enormously weedy, or impregnated with minerals of which there is comparatively little evidence in the Yellowstone Lake; while nowhere is this fish more abundant or excellent than in the main Yellowstone at Tower Falls, and thence on to its junction with the East Fork, and up the latter where the sulphur and other fumes arising from the water are so powerful as to be scarcely endurable. Nor have I in any region found trout more numerous or better than in the Soda Butte and Cache Creek branches of the East Fork, immediately below their famous mineral springs, notably in the latter, within the half mile below where the stream bubbles with hissing hot sulphur which impregnates and covers with a beautiful white and orange coating the rocky bed of the channel far below, and which this fish frequents.

Professor Leidy states that this worm is *Dibothrium cordiceps*, and is found in little sacks imbedded in fragments of flesh. He considers it as entirely different from the worms found in the European salmon. Owing, however, to the abundance of trout not affected with parasites, it may never be necessary for tourists to use those in question as an article of food. Still, no danger to health or life need be apprehended from eating the latter, as cooking absolutely destroys the worm; and in my opinion those epicures whose stomachs yearn for the trail of the woodcock or the intestinal contents of the snipe, need not hesitate at the insignificant parasites of the trout of Yellowstone Lake. This worm is not believed to be a constant parasite of this fish, however, since speci-

mens in good health are often taken, but showing scars or marks of outlets for them.

That in the Yellowstone Lake alone trout are infested with worms, notably where the Shoshone Lake trail strikes it; that they are here countless in number, in water bubbling with hot gases; that they voraciously take the bait, and that the angler can, without changing his position or removing the fish from the hook, rapidly boil them in seething pools, are not *statements* but *facts* capable of demonstration.

In addition to trout in the cool waters of the Yellowstone Creek and the Gallatin Fork of the Missouri, there may be found the mountain herring, one of the most delicious of fish. This, with the grayling, affords excellent sport for the fisherman; while the student of ichthyology will find numerous species of smaller fry to reward his collecting ardor.

REPTILES.

The large, yellowish spotted rattlesnake has been observed only in the Yellowstone Valley, below the Mammoth Hot Springs, and few reptiles of any variety have been found elsewhere in the Park.

INSECTS.

The indigenous and the migratory grasshoppers are found in vast numbers throughout the Park, and are useful for fish bait, as the trout of these regions do not usually take the artificial fly as well as those of the East. There are found extensive horizontal layers of these in some of the ancient snow and ice fields of the mountains, probably of the migratory species, chilled in their lofty flight, some of which, at least, do not revive to pestiferous activity in thawing, as is frequent with these insects.

The yellow gad-fly and several other varieties, aided by the musical mosquito, for a brief period of each summer, drive nearly all animals into "smudges" of smoke, or else high upon the snowy mountains to escape them.

There are no honey bees, and few if any of the other varieties of this insect, but wasps and a small but vindictive hornet abound in the valleys.

TIMBER OF THE PARK.

Much of interest and practical importance in reference to the forests of this proverbially timbered mountain park, is necessarily omitted from this report.

As stated in its proper connection, the ancient timber now found fossilized upon the mountain slopes, is evidently much larger and mainly of different varieties from that now growing in the Park, probably embracing a smaller proportion of the coniferæ.

Black or bastard fir is far the largest variety of timber now growing in the Park, and usually found scattered through forests of smaller timber near the Mammoth Hot Springs, Tower Falls, Upper Yellowstone, and other elevated terraces. It is often found from three to five feet in diameter and one hundred and fifty feet in height, and is not unlike the eastern hemlock in the irregular form of its branched-top as well as the coarse-grained, shaky, and inferior quality of its timber.

Black spruce, growing on the moist, sheltered slopes of the mountains, near the snow, though having a smaller trunk, is fully as tall as the black fir, and is a statelier tree and more valuable for timber or lumber.

Red fir is the next in size (which nearly equals that of the Norway pine of Michigan) and the first in value of any tree in the Park for hewn-timber for building bridges, &c., for which purposes it is admirably adapted. It is abundant in all except the very elevated regions.

White pine, rivaling in symmetrical beauty the white pine of the East, but much inferior in size, and somewhat in quality, is the prevailing timber of most of the elevated terrace groves, and occasionally of the narrow valleys and cañon passes of the mountains. It grows very densely, often rendering traveling among it upon horseback exceedingly difficult when standing and utterly impossible when burned and fallen, as it is over large areas of the Park, proving one of the greatest impediment to exploring as well as to improvement by roads and bridle-paths. It is the best material found in the Park for lumber, shingles, small timber, rafters, fence-poles, &c.

Balsam fir, somewhat different from that of the Alleghanies, is abundant and very beautiful, singly or in dense groves or isolated clumps scattered over the grassy slopes, just below the mountain snow-fields.

Cedar of a red or spotted variety, growing low and very branched, but with timber valuable for fence-posts, is abundant.

Poplar or aspen is found in dense thickets among the sheltered foothills. Dwarf maple, with leaves often scarlet with fungus, is sparingly found, and innumerable dense thickets of willow; the main value of all these last named varieties being for the food use of beaver or for bait.

CLIMATE OF THE PARK.

I greatly regret the breakage of our thermometers and consequent want of weather records until they were replaced, but the records given in the Appendix have been kept with great care and are deemed accurate and reliable.

As stated in my last year's report the records strengthen my previous impressions that the Park is less a severely cold than a peculiarly moist and stormy portion of these mountain regions, save during a brief but beautiful summer. The cause or causes of these peculiarities of temperature and moisture in the Park appear to be neither remote or difficult to comprehend. The anomalous heat and humidity of the atmosphere in all of the Fire Hole Basins is evident and traditional during the warm seasons of the year, when they are the best known. In fact all known of them in cold weather is my own experience during the early part of last winter, which tends to the belief that these geyser regions are relatively warm and moist in winter also. The terraces of the Mammoth Hot Springs and the cones to the various geyser and geyserite rims to other hot springs and sulphur pits are certainly much warmer than other rocky formations; and the adjacent areas of surface, if not indeed much of that of the Park, is at least somewhat warmer than that of other regions, for the snow in much of the Park seldom remains long even during moderately cold weather, nor is the earth often long or deeply frozen. For these reasons the terrible winter storms which cross the Sierra-Shoshone Range become much modified before crossing the Park, which observation and experience alike indicate is much warmer in winter than the less elevated surrounding regions.

ROUTES TO THE PARK.

The northern route has the advantages of cool summer travel upon the great lakes and the Missouri and Yellowstone Rivers, and railroad con-

nections with Manitoba and other British possessions, and ere long with Oregon, Washington Territory, and the northern route to Asia via the Northern Pacific Railroad. This latter railroad has recently been extended into Montana, and probably will reach the Yellowstone River in time for the coming season's tourists to enjoy a steamboat trip upon that romantic stream to at least the mouth of the Big Horn, and thence a coach trip via Bozeman to the Mammoth Hot Springs within the Park.

The southern route via the Central Pacific Railroad to California, as well as the Denver Pacific and other railroads to Saint Louis, affords great facilities for the Southern and Southwestern States and Territories, and for the increasing class of scientists and retired military and naval officers, or those upon leave of absence, who, while making the grand tour of the world, now annually visit the Park. The Utah Northern Railroad has entered Montana, and doubtless will deliver the coming season's tourists to where a thirty-mile coach ride upon the line of Gilmer & Salesbury will land them in Virginia City. Thence the coach line of Marshall & Goff will (upon a good road, mainly constructed by the public-spirited citizens of Virginia City) carry passengers via Henry's Lake direct to their hotel at the forks of the Fire Hole Rivers within the Park.

One of these routes presents the greatest variety of scenery, modes of travel, and somewhat shortest distance; the other the most direct continuous railroad connection, least coach or horseback travel, and consequently requires the least time; but practically both are convenient and necessary, as most persons with time and means will prefer going one route and returning the other.

Camp outfit and provisions can be purchased without extortion at Bozeman and Virginia City. At these places also, as well as at the Mammoth Hot Springs and at the Forks of the Fire Hole, reliable guides, with saddle outfit complete, will always be obtainable.

There will doubtless be regular mail communications from both Virginia City and Bozeman.

Time really necessary to view the leading wonders of the Park, ten days, but many more may be enjoyed with benefit; season of the year for a visit, July, August, and early September; cost of trip, although one of the most important considerations with most persons, is, from their diverse positions, tastes, and modes of travel, the most difficult to state, even approximately, but will range from \$400 to \$800 for the entire expenses of a visit to the mystic wonder-land. The best plan is, as recommended in last year's report, to make the Park the main object and turning-point of a season's rambles, visiting at least the Salt Lake and the Yellowstone regions upon the outward or return route.

It is expected that terms of leaseholds for hotel sites in the Park will be extended from ten to thirty years, and that leases will be effected to responsible parties, and at least some hotels at prominent points of interest will be erected; also, that a small steamboat upon the Yellowstone Lake will be constructed during the coming season.

Tabular statements concerning routes and trails will be found in the Appendix, marked F.

CONCLUSION.

In closing this report I beg to state that my assistants, Messrs. Stephens and Yount, have efficiently and faithfully discharged their respective duties, and cheerfully rendered every assistance in their power in my endeavors to carry into effect the wise policy of the Department of the Interior with regard to the National Park.

I also have to thank Mr. Chittenden, formerly of the Hayden survey, and Dr. W. J. Hoffman, of Washington, for elaborating some of the Hoodoo sketches made by Mr. W. H. Parker, who accompanied me in the exploration of the Goblin land. I am also indebted to Mr. W. H. Holmes for assistance in the preparation of the eastern portion of the map accompanying this report.

Finally, I would be derelict in duty did I omit to express my thanks for, and high appreciation of, the unvarying kindness I have ever received at your hands and those of other officers of the department over which you preside.

I am, very respectfully, your obedient servant,

P. W. NORRIS,
Superintendent Yellowstone National Park.

APPENDIX.

A.

REPORT OF GAMEKEEPER.

GAMEKEEPER'S CABIN,
YELLOWSTONE NATIONAL PARK,
November 25, 1860.

SIR: The notice of my appointment by the Hon. Carl Schurz, Secretary of the Interior, as gamekeeper of the Yellowstone National Park, with instructions to report to you as its superintendent for duty, reached me at Cheyenne, Wyoming Territory.

I at once accepted, but as the unusually deep snows and floods in the mountains prevented my crossing them from that direction, I proceeded by the railroad and coach-route, via Ogden and Bozeman, reporting at the headquarters of the Park July 6, and entering at once upon my duties.

My previous experience in the Park proved materially beneficial, as I knew the haunts and habits of the various animals and how to protect them from wanton slaughter by the numerous tourists.

Meeting the honorable Secretary of the Interior at the South Madison, near the southwestern corner of the Park, I accompanied him in his tour of its leading points of interest to the northeast corner at the cañon of Clark's Fork, where he left this region.

Returning to the Mammoth Hot Springs I outfitted and proceeded, via the Great Falls, to the foot and thumb of the Yellowstone Lake, and thence in a nearly direct route past Lake Riddle and a flat, open country, to Heart Lake at the foot of Mount Sheridan, some twenty-five miles from the Shoshone trail at the thumb of the Yellowstone Lake. From Heart Lake I crossed over to Barlow Valley at the foot of the Red Mountain range near the southern border of the Park, finding deer and elk in abundance, and some moose, and Heart Lake as well as all the cold streams teeming with extra fine trout and countless water-fowl.

Upon my return trip I explored the region around Lewis and Shoshone Lakes, finding along their northern terrace an excellent route for a trail of easy construction. I also found an excellent gravelly ford of Snake River, some two miles below Shoshone Lake.

Returning via the Yellowstone Lake and Falls to the Mammoth Hot Springs, I proceeded with men and animals to construct a cabin for my winter quarters at a good spring on the terrace commanding a fine view of both the East Fork and the Soda Butte Valleys. Here I purpose wintering so as to protect the game, especially elk and bison, in their sheltered chosen winter haunts, from the Clark's Fork and other miners.

I have, during the season, found elk, deer, and bear in all portions of the Park, antelope in most of the open regions, and moose in the willow beaver-swamps of the southern portion, and excellent trout in abundance in all the cold-water streams, excepting the Yellowstone, where, as well as in the lakes, this fish is infested with worms, and the Lewis and Shoshone, the waters of which, although remarkably cold and clear, are not inhabited by any species of the finny tribe.

Much of the game in the Park occasionally ranges over some of the adjacent regions, endangering their slaughter in the constantly advancing border settlements. Hence I would strongly recommend that all portions of the Park be well protected, that the game may remain, increase, and much of it soon become domesticated. But this cannot be done by any one man, and I would respectfully urge for the purpose the appointment of a small, active, reliable police force, to receive regular pay during the spring and summer at least, when animals are liable to be slaughtered by tourists and mountaineers. It is evident that such a force could, in addition to the protection of game, assist the superintendent of the Park in enforcing the laws, rules, and regulations for protection of guide-boards and bridges, and the preservation of the countless and widely scattered geyser-cones and other matchless wonders of the Park.

Most respectfully yours,

HARRY YOUNT,
Gamekeeper of the Yellowstone National Park.

Col. P. W. NORRIS,
Superintendent of the Yellowstone National Park.

B.

ACT OF DEDICATION.

AN ACT to set apart a certain tract of land lying near the headwaters of the Yellowstone River as a public park.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the tract of land in the Territories of Montana and Wyoming lying near the headwaters of the Yellowstone River, and described as follows, to wit: commencing at the junction of Gardiner's River with the Yellowstone River and running east to the meridian passing ten miles to the eastward of the most eastern point of Yellowstone Lake; thence south along the said meridian to the parallel of latitude passing ten miles south of the most southern point of Yellowstone Lake; thence west along said parallel to the meridian passing fifteen miles west of the most western point of Madison Lake; thence north along said meridian to the latitude of the junction of the Yellowstone and Gardiner's Rivers; thence east to the place of beginning, is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people; and all persons who shall locate, settle upon, or occupy the same or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom.

SEC. 2. That said public park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable, to make and publish such rules and regulations as he may deem necessary or proper for the care and management of the same. Such regulations shall provide for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition.

The Secretary may, in his discretion grant leases for building purposes, for terms not exceeding ten years, of small parcels of ground, at such places in said park as shall require the erection of buildings for the accommodation of visitors; all of the proceeds of said leases, and all other revenues that may be derived from any source connected with said park, to be expended under his direction in the management of the same and the construction of roads and bridle-paths therein. He shall provide against the wanton destruction of the fish and game found within said park and against their capture or destruction for the purpose of merchandise or profit. He shall also cause all persons trespassing upon the same after the passage of this act to be removed therefrom, and generally shall be authorized to take all such measures as shall be necessary or proper to fully carry out the objects and purposes of this act.

Approved March 1, 1872.

NOTE.—The boundaries of the Park have never been surveyed, but they are mainly crests of snow-capped basaltic mountains encircling the wonder-land of cataracts, cañons, fire-hole basins, geysers, saeas, fumeroles, &c., unique and matchless, with an entire area from fifty to seventy-five miles square.

C.

RULES AND REGULATIONS.

1st. All hunting, fishing, or trapping within the limits of the Park, except for purposes of recreation, or to supply food for visitors or actual residents, is strictly prohibited; and no sales of fish or game taken within the Park shall be made outside of its boundaries.

2d. Persons residing within the Park, or visiting it for any purpose whatever, are required under severe penalties to extinguish all fires which it may be necessary to make, before leaving them. No fires must be made within the Park except for necessary purposes.

3d. No timber must be cut in the Park without a written permit from the superintendent.

4th. Breaking the siliceous or calcareous borders or deposits surrounding or in the vicinity of the springs or geysers for any purpose, and all removal, carrying away, or sale of specimens found within the Park, without the consent of the superintendent, is strictly prohibited.

5th. No person will be permitted to reside permanently within the limits of the Park without permission from the Department of the Interior, and any person now living

within the Park shall vacate the premises occupied by him within thirty days after having been served with a written notice so to do, by the superintendent or his deputy, said notice to be served upon him in person or left at his place of residence.

NOTE.—These rules and regulations are those adopted by the Hon. C. Delano, Secretary of the Interior, at the dedication of the Park.

D.

APPEAL.

To whom it may concern :

Under the above law, rules and regulations, and my peculiar circumstances of health, long acquaintance, and business interest in those regions, I have accepted the responsible, but as yet neither lucrative nor desirable position of superintendent of the Yellowstone National Park. Have appointed J. C. McCartney, esq., proprietor of the Mammoth Hot Springs Hotel, assistant until my arrival via the Yellowstone River route, which, I trust, will be in June, unless delayed by the Indians.

Meanwhile, *bona-fide* occupants of buildings, bridges, mines, &c., will, by due regard for the above rules and the future interests of the public in the Park, be allowed quietly to remain. The outburst of national enthusiasm at discovery of the matchless wonders of the fire-hole and geyser basins, amid the Rocky Mountains, secured their prompt dedication as a national park for the weary and worn business man, the tourist, and the scientist forever; also, provision for the appointment of a superintendent under proper rules and instructions, but not the necessary appropriations to reward the one for the enforcement of the other.

My predecessor, Mr. N. P. Langford, did all that was proper to expect under the circumstances while in Montana, but with his return East all restraint ceased, and for fully two years, careless use of fire, wanton slaughter of rare and valuable animals, and vandalism of matchless wonders have, as so truthfully published in letters of myself and others, been doing irreparable injury in all the explored portions of the Park.

Under these peculiar circumstances, in the interest of science and of the tourist now and in the future, the welfare and good fame of the people of Montana, Utah, and Wyoming in general, and especially to my old mountain comrades and friends, do I most earnestly appeal, to abstain, and use all influence in urging others to desist from future vandalism of all kinds in the lofty, romantic "wonder-land."

With the closing of the Sioux war, the extension of the Northern Pacific Railroad, the opening of the Yellowstone natural route and the Big Horn Mountains for exploration of their vast gold and silver mines, an influx of sturdy miners and herdsmen will soon gather wealth, build towns, and open safe and convenient routes of access to this now isolated, little known, but matchless national heritage of wonders.

That the spirit in which I write and act in this matter may extend to the press and the people of those mountain regions and the tourists who visit them is my ardent desire.

P. W. NORRIS,

Superintendent of the Yellowstone National Park.

E.

Weather record kept in the Yellowstone National Park during the season of 1880, at the Mammoth Hot Springs.

[Latitude, 44° 58' north; longitude 110° 42' west; elevation, 6,460 feet.]

Date.	Temperature.			Sky.	Snow.	Wind.			Remarks.
	Sunrise.	Noon.	Sunset.			Sunrise.	Noon.	Sunset.	
1880.					Ins.				
January 1.....	25	28	26	Cloudy	.....	SE.	SE.	SE.	Gale.
January 2.....	30	33	30	do	2	SE.	SE.	SE.	Do.
January 3.....	26	30	28	do	.....	SE.	SE.	SE.	Do.
January 4.....	26	44	30	Clear	.....	SE.	SE.	SE.	Do.
January 5.....	30	30	28	Cloudy	.....	SE.	SE.	SE.	Do.
January 6.....	30	30	30	do	.....	SE.	SE.	SE.	Do.
January 7.....	28	46	30	do	.....	SE.	SE.	SE.	Intermittent.

Weather record kept in the Yellowstone National Park, &c.—Continued.

Date.	Temperature.			Sky.	Snow.	Wind.			Remarks.
	Sunrise.	Noon.	Sunset.			Sunrise.	Noon.	Sunset.	
1880.									
January 8.....	30	26	25	Cloudy	<i>Ins.</i> 1	SE.	SE.	N.	Gale.
January 9.....	20	22	20	do	4	SE.	SE.	SE.	
January 10.....	14	16	10	Clear		SE.	SE.	SE.	
January 11.....	6	10	10	do		N.	SE.	SE.	
January 12.....	10	16	14	do		SE.	SE.	SE.	
January 13.....	22	30	28	do		SE.	SE.	SE.	
January 14.....	22	30	28	do		SE.	SE.	SE.	
January 15.....	30	32	30	do		E.	SE.	SE.	
January 16.....	28	32	32	do			W.	SW.	
January 17.....	30	50	32	do			SE.	S.	
January 18.....	30	44	38	do		SE.	SE.	SE.	
January 19.....	30	34	29	do		SE.	SE.	SE.	
January 20.....	20	32	28	do		SE.	SE.	SE.	
January 21.....	18	35	23	do		SE.	SE.	SE.	
January 22.....	22	34	23	do		SE.	SE.	SE.	
January 23.....	22	38	20	do		SE.	SE.	SE.	
January 24.....	22	26	20	do		SE.	SE.	SE.	
January 25.....	29	22	18	do		SE.	SE.	SE.	
January 26.....	8	29	18	Cloudy	6	N.	N.	N.	Very little wind; Thermometer fell 26° in $\frac{1}{2}$ hour.
January 27.....	— 8	18	— 4	Clear		N.	N.	N.	
January 28.....	— 4	26	6	Cloudy	6	N.	N.	N.	
January 29.....	— 16	— 36	0	Clear		N.	N.	N.	
January 30.....	— 16	15	4	do		N.	N.	N.	Calm.
January 31.....	4	40	12	do					
Average of January	18	27	21						
Mean		22							
1881.									
February 1.....	2	38	18	Cloudy	2	SE.	SE.	SE.	Gale.
February 2.....	2	28	20	do		SE.	SE.	SE.	
February 3.....	10	22	18	do	1	N.	N.	N.	
February 4.....	12	18	10	do	1	N.	N.	N.	
February 5.....	12	24	16	do		SW.	SW.	SW.	Gale.
February 6.....	14	48	22	Clear		SE.	SE.	SE.	
February 7.....	14	48	18	do		SE.	SE.	SE.	
February 8.....	18	35	22	do		S.	S.	S.	
February 9.....	19	36	24	do		SW.	SW.	SW.	Gale.
February 10.....	17	36	26	do		SW.	SW.	SW.	
February 11.....	22	28	13	Cloudy	1	NW.	NW.	NW.	Gale.
February 12.....	2	24	10	Clear		S.	S.	S.	
February 13.....	12	21	11	Cloudy	3	N.	N.	N.	Gale.
February 14.....	14	24	22	do	3	SW.	SW.	SW.	
February 15.....	24	25	20	do	2	SW.	SW.	SW.	
February 16.....	10	14	1	do	1	SW.	SW.	SW.	
February 17.....	2	30	4	Clear		SW.	SW.	SW.	Flying snow.
February 18.....	4	30	18	do		SE.	SE.	SE.	
February 19.....	20	32	26	Cloudy	4	SE.	SE.	SE.	
February 20.....	20	42	30	Clear		SE.	SE.	SE.	
February 21.....	26	42	24	do		SE.	SE.	SE.	Flying snow.
February 22.....	26	62	36	do		SE.			
February 23.....	22	42	30	do		SE.	SE.	SE.	
February 24.....	22	37	24	Cloudy		SE.	SE.	SE.	
February 25.....	24	22	26	do	1	SE.	SE.	SE.	Flying snow.
February 26.....	18	20	18	do	1	NW.	NW.	NW.	
February 27.....	— 16	6	— 6	Clear		NE.			
February 28.....	— 2	14	6	Cloudy		SW.	SW.	SW.	
February 29.....	6	12	17	do	1	SE.	SE.	SE.	
Average of February	12	28	18						
Mean		20							

Considerable snow on the ground; all the hollows full, with a very hard crust, sufficient to bear a horse up; heavy drifts on north side of hills; the pass on Geysers road almost level with snow.

Weather record kept in the Yellowstone National Park, &c.—Continued.

Date.	Temperature.			Sky.	Snow.	Wind.			Remarks.
	Sunrise.	Noon.	Sunset.			Sunrise.	Noon.	Sunset.	
1880.									
March 1.....	22	32	33	Cloudy	Ins.	S.	SE.	SE.	Flying snow.
March 2.....	36	34	34	do	2	SE.	SE.	SE.	
March 3.....	20	28	28	do	1	SE.	SE.	SE.	
March 4.....	18	18	14	do		SW.	NW.	SE.	
March 5.....	12	24	18	do	1½	NE.	SE.	SE.	Gale.
March 6.....	22	34	21	do	2	S.	NW.	N.	
March 7.....	14	26	22	do	½	SE.	S.	SE.	
March 8.....	22	34	18	Clear		N.	NW.	W.	
March 9.....	0	30	20	do		SE.		W.	
March 10.....	18	26	26	Cloudy	6	SW.	SW.	SW.	
March 11.....	6	— 2	— 8	do		NW.	NW.	NW.	
March 12.....	—30	— 2	—10	Clear		N.	N.	S.	
March 13.....	—40	— 0	—20	do			S.	S.	Mercury frozen.
March 14.....	14	20	18	do					
March 15.....	— 4	20	8	do				SE.	
March 16.....	— 2	20	14	do		SE.	SE.	SE.	
March 17.....	0	40	22	do					
March 18.....	14	30	23	Cloudy				SW.	
March 19.....	20	50	28	Clear					
March 20.....	18	32	24	do		SE.	SE.	SE.	
March 21.....	20	50	28	do		SE.	SE.	SE.	
March 22.....	22	48	36	do		SE.	SE.	SE.	
March 23.....	21	*71	*48	do		SE.	SE.	SE.	
March 24.....	28	50	40	do			SW.	E.	
March 25.....	36	43	34	do	1		E.	E.	
March 26.....	20	36	24	do	½		E.	E.	
March 27.....	19	34	30	do	½	SE.	SE.	SE.	
March 28.....	26	46	35	do	½		SE.	SE.	
March 29.....	23	38	26	do	½			SE.	
March 30.....	18	22	22	do	½			SE.	
March 31.....	18	22	30	do	½	S.	S.	S.	
Average of March	13	30	22						
Mean		22							

* In sun.

Weather record kept in the Yellowstone National Park, &c.—Continued.

Date.	Temperature.			Remarks.
	Sunrise.	Noon.	Sunset.	
1880.				
July 1.....	42	50	46	Clear.
July 2.....	41	48	44	Do.
July 3.....	50	56	54	Do.
July 4.....	47	58	51	Do.
July 5.....	50	61	54	Do.
July 6.....	49	70	61	Do.
July 7.....	58	75	64	Do.
July 8.....	58	64	58	Do.
July 9.....	54	67	60	Do.
July 10.....	51	58	54	Do.
July 11.....	46	58	50	Do.
July 12.....	40	48	46	Do.
July 13.....	47	59	50	Do.
July 14.....	50	61	56	Do.
July 15.....	51	72	68	Do.
July 16.....	54	80	72	Do.
July 17.....	52	84	71	Rain.
July 18.....	58	85	66	Do.
July 19.....	61	86	68	Windy.

Weather record kept in the Yellowstone National Park, &c.—Continued.

Date.	Temperature.			Remarks.
	Sunrise.	Noon.	Sunset.	
1880.				
July 20.....	50	88	70	Clear.
July 21.....	53	92	71	Do.
July 22.....	54	84	69	Do.
July 23.....	55	80	60	Rain and hail.
July 24.....	55	76	65	Clear.
July 25.....	52	73	58	Showers.
July 26.....	48	72	60	Clear.
July 27.....	51	58	50	Rain.
July 28.....	41	52	50	Showers.
July 29.....	38	51	49	Do.
July 30.....	48	65	64	Clear.
July 31.....	57	68	63	Do.
Average of July	50	68	62	
Mean		66		
August.				
August 1.....	50	76	68	Rain.
August 2.....	48	73	64	Rain and hail.
August 3.....	49	74	68	Clear.
August 4.....	50	85	76	Do.
August 5.....	60	76	70	Do.
August 6.....	52	72	70	Do.
August 7.....	48	82	74	Do.
August 8.....	58	84	70	Do.
August 9.....	52	80	72	Do.
August 10.....	60	75	70	Do.
August 11.....	58	76	72	Do.
August 12.....	52	80	68	Rain.
August 13.....	53	62	67	Do.
August 14.....	48	80	54	Do.
August 15.....	50	74	67	Clear.
August 16.....	48	75	67	Do.
August 17.....	52	78	75	Do.
August 18.....	57	60	55	Rain.
August 19.....	46	61	58	Showers.
August 20.....	48	76	70	Clear.
August 21.....	48	76	68	Do.
August 22.....	50	76	67	Do.
August 23.....	50	84	74	Do.
August 24.....	52	76	62	Do.
August 25.....	44	55	60	Do.
August 26.....	50	65	60	Do.
August 27.....	45	65	60	Do.
August 28.....	46	68	66	Do.
August 29.....	48	50	44	Rain and hail.
August 30.....	38	52	42	
August 31.....	35	56	46	
Average of August	50	68	64	
Mean		61		

Weather record kept in the Yellowstone National Park, &c.—Continued.

Date.	Temperature.			Remarks.
	Sunrise.	Noon.	Sunset.	
1880.				
September 1.....	40	66	62	Clear.
September 2.....	43	63	60	Do.
September 3.....	44	64	62	Do.
September 4.....	50	75	70	Do.
September 5.....	48	80	68	Do.
September 6.....	48	78	68	Do.
September 7.....	48	78	68	Do.
September 8.....	50	74	66	Do.
September 9.....	48	69	67	Do.
September 10.....	48	66	62	Do.
September 11.....	32	56	45	Do.
September 12.....	30	68	46	Do.
September 13.....	40	68	58	Do.
September 14.....	46	65	56	Do.
September 15.....	42	68	62	Do.
September 16.....	44	76	62	Do.
September 17.....	49	72	62	Do.
September 18.....	44	42	42	Rain.
September 19.....	30	56	46	Clear.
September 20.....	31	65	56	Do.
September 21.....	38	68	55	Do.
September 22.....	34	67	66	Do.
September 23.....	54	60	54	Do.
September 24.....	36	62	54	Do.
September 25.....	42	58	42	Do.
September 26.....	30	67	42	Do.
September 27.....	42	62	58	Do.
September 28.....	42	62	50	Do.
September 29.....	38	73	60	Do.
September 30.....	50	75	66	Do.
Average of September	41	66	58	
Mean		55		
October 1.....	45	75	54	Clear.
October 2.....	40	76	60	Do.
October 3.....	39	78	67	Do.
October 4.....	40	80	66	Do.
October 5.....	40	76	62	Partly cloudy.
October 6.....	44	78	60	Do.
October 7.....	40	64	58	Do.
October 8.....	40	60	38	Rain.
October 9.....	42	58	32	Snow.
October 10.....	26	32	26	Clear.
October 11.....	14	46	34	Do.
October 12.....	22	56	36	Do.
October 13.....	34	44	36	Snow.
October 14.....	30	34	28	Do.
October 15.....	22	36	28	Do.
October 16.....	29	34	26	Do.
October 17.....	42	50	36	Misty.
October 18.....	30	62	48	Clear.
October 19.....	27	60	41	Do.
October 20.....	28	62	40	Do.
October 21.....	50	70	47	Do.
October 22.....	32	72	48	Do.
October 23.....	30	68	46	Do.
October 24.....	30	66	43	Cloudy.
October 25.....	42	55	43	Rain.
October 26.....	39	55	44	Clear.
October 27.....	35	55	49	Cloudy.
October 28.....	48	55	42	Cloudy: snow in north.
October 29.....	26	42	32	Clear.
October 30.....	14	30	26	Do.
October 31.....	15	43	32	Do.
Average of October	32	57	42	
Mean		44		

Weather record kept in the Yellowstone National Park, &c.—Continued

Date.	Sunrise.	Noon.	Sunset.	Remarks.
November 1.....	28	56	40	Clear; wind southeast.
November 2.....	32	40	40	Do.
November 3.....	30	29	24	Cloudy; wind southeast.
November 4.....	10	28	26	Clear; wind southeast.
November 5.....	14	28	26	Do.
November 6.....	30	36	40	Clear; wind southwest.
November 7.....	32	36	36	Do.
November 8.....	16	38	32	Cloudy; wind southwest.
November 9.....	16	36	34	Cloudy.
November 10.....	20	34	32	Cloudy; breeze southeast.
November 11.....	7	33	15	Clear; breeze southeast.
November 12.....	10	41	16	Do.
November 13.....	10	41	32	Clear; wind southwest.
November 14.....	20	50	38	Do.
November 15.....	26	34	14	Cloudy; wind southwest.
November 16.....	-3	-8	-10	Cloudy; wind northwest.
November 17.....	-21	-10	-12	Do.
November 18.....	-8	-12	-18	Clear; wind northwest.
November 19.....	-14	-16	-22	Snow; heavy; wind northwest.
November 20.....	-10	-12	-8	Snow-squalls; wind northwest.
November 21.....	-2	14	12	Clear; wind south.
November 22.....	-8	12	16	Do.
November 23.....	-10	16	14	Do.
November 24.....	-10	20	16	Clear; wind northwest.
November 25.....	-0	24	22	Do.
November 26.....	-18	2	20	Do.
November 27.....	-2	24	22	Clear; wind southeast.
November 28.....	-4	26	20	Do.
November 29.....	-12	30	18	Clear; wind northwest.
November 30.....	-14	-16	-18	Snow-squalls; wind northwest.
Average of the month.....	5	24	17	Clear days, 20.
Mean.....		15		Heavy winds most of the month.

Date.	Sunrise.	Noon.	Sunset.	Remarks.		
				Snowfall.	Sky.	Wind.
December 1.....	-16	-26	-22	12 inches.	Cloudy	NW.
December 2.....	-12	-6	-8	18 inches.	do	NW.
December 3.....	-14	-18	-19	18 inches.	do	NW.
December 4.....	-6	18	16	8 inches.	do	W.
December 5.....	14	34	20		Clear	W.
December 6.....	22	36	28		do	S.
December 7.....	20	42	25		do	S.
December 8.....	30	49	37		Partly cloudy	S.
December 9.....	20	48	36		Clear	S.
December 10.....	24	32	34		do	S.
December 11.....	38	44	38		do	S.
December 12.....	28	50	30		do	S.
December 13.....	30	44	38		do	S.
December 14.....	32	38	38	1/2 inch.	Cloudy	W.
December 15.....	28	28	20		do	SE.
December 16.....	19	27	20		Clear	SE.
December 17.....	9	27	18		do	SE.
December 18.....	19	36	28		do	SE.
December 19.....	22	32	30		do	SE.
December 20.....	26	32	32	1 1/2 inches.	Cloudy	SW.
December 21.....	18	24	22	1/2 inch.	do	NW.
December 22.....	22	30	29	1 inch.	do	SE.
December 23.....	27	32	30	2 inches.	do	SE.
December 24.....	24	28	29	3 inches.	do	SE.
December 25.....	30	36	36	2 inches.	do	SE.
December 26.....	30	37	30		do	SE.
December 27.....	26	11	-6		do	NW.
December 28.....	-6	-12	-4	4 inches.	do	NW.
December 29.....	-20	-6	-6	3 inches.	do	NW.
December 30.....	-8	-10	-11	3 inches.	do	SE.
December 31.....	14	26	28	2 inches.	do	SE.
Average of the month.....	16	25	20	7 1/2 inches, or 6 1/2 feet.	19 cloudy days and 3 heavy gales.	
Mean.....		20				

F.

ROUTES IN THE YELLOWSTONE NATIONAL PARK.

HENRY'S LAKE ROAD.

Route.	Between points.	Total
	Miles.	Miles.
Henry's Lake Mail Station to—		
South Madison Station.....	10	
South Madison to—		
Riverside Station.....	10	20
Lookout Cliffs.....	3	23
Marshall's Park.....	5	28
Forks of the Fire Holes Station.....	7	35

MAMMOTH HOT SPRINGS ROAD.

Forks of the Fire Holes to—		
Lookout Terrace.....	3	
Forks of road.....	2	5
Earthquake Cliffs.....	2	7
Cañon Creek.....	4	11
Falls of the Gibbon.....	1	12
Cañon of the Gibbon.....	1	13
Head of Gibbon Cañon.....	3	16
Monument Geysers and return.....	2	18
Geyser Creek.....	2	20
Norris Geyser Basin.....	3	23
Norris Fork Station.....	1	24
Lake of the Woods.....	6	30
Obsidian Cliffs.....	4	34
Willow Park.....	2	36
Indian Creek.....	5	41
Swan Lake.....	2	43
Rustic Falls.....	2	45
Terrace Pass.....	2	47
Mammoth Hot Springs Station.....	3	50

ROAD TO BOZEMAN.

Mammoth Hot Springs to—		
Mouth of Gardiner River.....	5	
Second Cañon of the Yellowstone.....	13	18
Cañon Gap.....	4	22
Bottler's Ranch.....	12	34
Bozeman.....	40	74

MADISON CANON ROAD.

Forks of the Fire Holes to—		
Lookout Terrace.....	3	
Falls of the Madison.....	3	6
Mouth of the Gibbon.....	4	10
Gibbon, Fire Hole Basin, and return.....	2	12
Foot of Madison Cañon.....	6	18
Riverside Station.....	3	21

ROAD TO THE UPPER GEYSER BASIN.

Forks of the Fire Holes to—		
Prospect Point.....	1	
Lower Geyser Basin.....	1	2
Midway Geyser Basin.....	3	5
Upper Geyser Basin.....	5	10

Routes in the Yellowstone National Park—Continued.

NED PERCÉ FORD TRAIL.

Route.	Between points.	Total.
Indian Pond to—		
Pelican Valley	3	6
Ford of Pelican Creek	3	6
Nez Percé Ford of the Yellowstone	6	12

GRAND CAÑON TRAIL.

Tower Falls to—		
Forks of Washburn Trail	3	6
Rowland's Pass	3	9
Sulphur Basin	3	11
Meadow Camp	2	13
Brink of Grand Cañon	2	15
Lookout Point	2	16
Great Falls of Yellowstone	1	

TWIN FALLS TRAIL.

Meadow Camp to—		
Head of Grand Cañon	2	3
Safety-Valve Geyser	1	4
Twin Falls on Yellowstone River	1	

SPRING CREEK TRAIL.

Great Falls of Yellowstone to—		
Spring Creek	2	3
Great Spring	1	5
Cascade Creek	2	

FOSSIL FOREST TRAIL.

Gamekeeper's Cabin to—		
Foot of mountain	3	6
Summit of Amethyst Mountain	3	11
Orange Creek	4	15
Sulphur Hills	4	23
Forks of Pelican Creek	5	28
Indian Pond	3	31
Lower ford, Pelican Creek	3	34
Foot of Yellowstone Lake	3	

STINKING WATER TRAIL.

Forks of the Pelican to—		
Summit of pass	4	10
Cañon through first range	6	

TRAIL AND PROPOSED ROAD TO THE YELLOWSTONE LAKE AND FALLS.

House in Upper Geyser Basin to—		
Cascades of the Fire Hole Rivers	3	8
Norris Pass of the main divide	5	10
Shoshone Creek, 2 miles from the lake	2	15
Columbia River and Pacific waters	7	22
Two Ocean Pond	5	30
Hot Springs on Yellowstone Lake	7	42
Cliffs on lake	8	47
Bridge Creek Bay	12	
Foot of Yellowstone Lake	5	

Routes in the Yellowstone National Park—Continued.

TRAIL AND PROPOSED ROAD TO THE YELLOWSTONE LAKE AND FALLS—Continued.

Route.	Between points.	Total.
Mud Volcano	8	55
Sulphur Mountain	4	59
Alum Creek	3	62
Great Falls of the Yellowstone	3	65
Return to Alum Creek	3	68
Hot Sulphur Springs	11	79
Mary's Lake	3	82
Cold Spring Creek	9	91
Forks of the Fire Hole River	7	98

MIDDLE GARDINER TRAIL.

Mammoth Hot Springs to—		
The West Gardiner	2	.....
Falls of the Middle Gardiner	2	4
Sheepsteer Cliffs	2	6
Road to the Geysers	1	7

TRAIL TO FORKS OF THE YELLOWSTONE.

Mammoth Hot Springs to—		
Forks of the Gardiner	2	.....
Lower Falls of the East Fork of the Gardiner	1	3
Upper Falls of the Gardiner	1	4
Cascades of the Gardiner	1	5
Black Tail Creek	3	8
Dry Cañon or Devil's Cut	7	15
Pleasant Valley	3	18
Forks of the Yellowstone	2	20

MOUNT WASHBURN TRAIL.

Forks of the Yellowstone to—		
Tower Falls	3	.....
Snowy spur of Mount Washburn	6	9
Dunraven's Pass	3	12
Cascade Creek	4	16
Great Falls of the Yellowstone	4	20

MINERS' TRAIL TO CLARK'S FORK MINES.

Forks of Yellowstone to—		
Crystal Creek	5	.....
Amethyst Creek	5	10
Gamekeeper's Cabin	5	15
Soda Butte Medicinal Springs	3	18
Trout Lake	2	20
Smelter at mines (Cook City)	11	31
Index Peak	5	36

ROUTE TO HOODOO BASIN.

Gamekeeper's Cabin to—		
Sulphur Springs	2	.....
Ford of Cache Creek	1	3
Alum Springs and return	4	7
Calfee Creek	7	14
Miller's Creek	5	19
Forks of Miller's Creek	10	29
Miller's Camp	6	35
Hoodoo Mountain	3	38

RECAPITULATION OF ROADS AND TRAILS WITHIN THE PARK.

Roads.

	Miles.
Mammoth Hot Springs to northern line of the Park	6
Mammoth Hot Springs to Cañon of East Gardiner.....	3
Mammoth Hot Springs to Cañon of West Gardiner	2
Mammoth Hot Springs to Forks of the Fire Holes	50
Madison Cañon Road	18
Forks of the Fire Holes to west line of the Park	20
Forks of the Fire Holes to house in Upper Geysers.....	10
Total length of roads	109

Trails.

Nez Percé Ford Trail	13
Grand Cañon Trail.....	16
Twin Falls Trail	4
Spring Creek Trail.....	5
Clark's Fork Mines	36
Hoodoo Basin.....	38
Fossil Forests.....	34
Stinking Water.....	10
Shoshone and Yellowstone Lake.....	98
Middle Gardiner	7
Forks of the Yellowstone.....	20
Mount Washburn.....	20
Nez Percé Ford	12
Total length of trails	312



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